CITY OF BATON ROUGE
PARISH OF EAST BATON ROUGE

December 3, 2024

ADDENDUM NO. 2

TO: **ALL BIDDERS**

SUBJECT: **MALL OF LOUISIANA BOUELVARD**
(RR BRIDGE AND PUMP STATION)

CITY-PARISH PROJECT No. 12-CS-HC-0043D

BID DATE: TUESDAY, DECEMBER 10, 2024

ORIGINAL BID DATE: TUESDAY, DECEMBER 10, 2024 at 2:00 p.m.
ADDENDUM NO. 2 REVISED BID DATE: TUESDAY, JANUARY 7, 2025 at 2:00 p.m.

The following revisions shall be incorporated in and take precedence over any conflicting part of the original contract documents.

PART 2, SPECIAL PROVISIONS AND CONTRACT DOCUMENTS

SPECIAL PROVISIONS/TECHNICAL SPECIFICATIONS

The Special Provisions are amended to add the following items included in ATTACHMENT B.

- Geotechnical Engineering Services report dated July 11, 2014.
- Geotechnical Engineering Services report dated November 9, 2016.
- Geotechnical Engineering Services report dated December 22, 2020.

RESPONSES TO BIDDER QUESTIONS

QUESTION 1:
Sheet 451 references geotechnical report dated 7/11/2014. Has this been provided to the contractors? I could not locate.
Response:
Included in this Addendum as an attachment.

QUESTION 2:
What is the voltage?
Response:
Contact the utility provider directly.

QUESTION 3:
Will jointed rail be allowed on the temporary shoofly?
Response:
No.

QUESTION 4:
Please confirm #4 AREMA limestone ballast is allowable for shoofly and new bridge rail.
RESPONSE:
No.

QUESTION 5:
Please confirm that Xypex crystalline waterproofing material is what the owner is requiring for deck waterproofing.

RESPONSE:
Yes.

QUESTION 6:
Would a Building Construction license be acceptable, as it covers all?
RESPONSE:
No.

QUESTION 7:
Will the City-Parish construct temporary barricades upon the completion of this project?
RESPONSE:
Yes.

QUESTION 8:
Some of the storm drain pipe sheets identify flowable backfill. Please provide list of all affected pipe runs.
RESPONSE:
Shown on plans.

QUESTION 9:
Will the connecting storm drain structures also require flowable backfill?
RESPONSE:
Yes, as noted on plans.

QUESTION 10:
Will the contractor be permitted to cross the new bridges over Dawson Creek to access the project?
RESPONSE:
No.

QUESTION 11:
Will the contractor be permitted to use World Ministry Ave. to access the project?
RESPONSE:
Yes.

QUESTION 12:
Please provide dimensions for the leveling pad located under the MSE Wall. (Sheet 95)
RESPONSE:
Determined by MSE wall vendor.

QUESTION 13:
What is the required vertical spacing for the MSE Wall soil reinforcement? (Sheet 95)
RESPONSE:
Determined by MSE wall vendor.

QUESTION 14:
Please provide the current list of City-Parish EBE contractors.
RESPONSE:
Contact City-Parish Purchasing.

QUESTION 15:
Please provide a copy of the geotechnical investigation report as referenced in the contract documents.
RESPONSE:
Included in this Addendum as an attachment.

UNIFORM CONSTRUCTION BID FORMS

With reference to Page UCBF 1 of 4, the Bidder shall indicate receipt of this Addendum in the space provided. Failure to indicate receipt of this Addendum may be cause for the bid to be rejected.

For online www.centralbidding.com bidders: An acknowledgment of this addendum will be prompted by the Expedite bidding program prior to formally submitting the bid. Technical addendums may have been created on the Central Bidding website for any changes made due to errors of input of schedule of bid items. The technical addendums might not be numbered the same as paper copy addendums that DPW issues to contractors who have picked up plans directly from them. Contractor should be aware that the technical addendums must be acknowledged when submitting the bid.

APPROVED:

Thomas Stephens, P.E.
Chief Design & Construction Engineer

ATTACHMENT B

Geotechnical Engineering Services

Picardy to Perkins Connector Project
Baton Rouge, Louisiana
for
Evans-Graves Engineers, Inc.
July 11, 2014

GeoEngineers
Earth Science + Technology

ATTACHMENT B

Geotechnical Engineering Services

Picardy to Perkins Connector Project
Baton Rouge, Louisiana

for
Evans-Graves Engineers, Inc.

July 11, 2014

GeoEngineers
11955 Lakeland Park Blvd., Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

ATTACHMENT B

Geotechnical Engineering Services
Picardy to Perkins Connector Project
Baton Rouge, East Baton Rouge Parish, Louisiana

File No. 16710-051-00

July 11, 2014

Prepared for:

Evans-Graves Engineers, Inc.
9029 Jefferson Highway, Suite 200
Baton Rouge, Louisiana 70809

Attention: Gerald G. Menard, PE

Prepared by:

GeoEngineers, Inc.
11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

for
Ivy A. Harmon, EI
Geotechnical Engineer

Larry D. Sant, PE
Associate Geotechnical Engineer

LARRY DEAN SANT
License No. 35625
07-11-2014

Charles L. Eustis
For James M. Aronstein, Jr., PE
Principal

IAH: LDS:JMA: cc

GEOENGINEERS

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INTRODUCTION

This report presents the results of our geotechnical engineering services in support of your design of the Picardy to Perkins Connector Project in Baton Rouge, Louisiana. The report was first issued on June 5, 2014 in draft form for your review. On July 7, 2014, we received from the Green Light Plan engineers one comment that furnished traffic report data and requested pavement design based on that data. Such pavement design has now been incorporated into this report. Our understanding of the project was developed through discussions with and review of materials transmitted by Evans-Graves Engineers, Inc. (Evans-Graves). The approximate project location is shown on the Vicinity Map, Figure 1.

We understand that the project will include about 3,000 lineal feet of new roadway, two 220-foot long bridges over Dawson Creek, one railroad overpass bridge, one below-grade roadway with retaining walls, and privacy walls.

SCOPE OF SERVICES

Our services for this project were completed in general accordance with our revised proposal dated November 28, 2012. The agreement was signed on June 13, 2013 for authorization of these services. The scope of services was based on the information provided by you during our meetings and correspondence. The purpose of our geotechnical services is to provide geotechnical recommendations specific to this site for design and construction based on site exploration, laboratory testing and geotechnical engineering analyses. Our scope of services is divided into two subsections, exploration and laboratory services, and design services.

Exploration and Laboratory

1. Contacted Louisiana “One-Call” to notify them of our intent to perform soil borings at these sites and to clear the boring locations of potential underground utilities.

2. Obtained property access agreements from Citizens Bank and Trust Co., First Bank and Trust (Perkins-Rowe), Family Worship Center Church, Inc. (Jimmy Swaggart Ministries), and GGP/Mall of Louisiana LLC.

3. Completed 31 explorations. We completed these drilled borings at the following locations and depths:

   - three borings to 120 feet deep each at the Dawson Creek bridge structure, including one boring in the creek, along the Picardy to Perkins Connector route;
   - three borings to 120 feet deep each at the Backcourt Drive bridge structure, including one boring in Dawson Creek;
   - three borings to 120 feet deep each for the railroad overpass structure;
   - two borings to 120 feet deep, four borings to 60 feet deep, and six borings to 30 feet deep each along the retaining walls for the underpass route; and

- ten borings to 20 feet deep each along the roadway and privacy walls between Perkins Road and the railroad overpass.

The soil borings were sampled continuously in the upper 10 feet at the bridge abutments and roadways, and on 5-foot centers elsewhere with a truck-mounted drill rig or an ATV rig. The two borings in Dawson Creek were sampled using a marsh buggy rig. Our field representative logged the explorations and obtained samples of soil from each boring. Sampling involved obtaining undisturbed cores of cohesive clay/silt with 3-inch outside diameter thin-walled Shelby tubes, while the Standard Penetration Test (SPT) was performed in granular soils/sands.

4. Each borehole was sealed immediately upon completion of sampling per State of Louisiana requirements.

5. Performed laboratory testing consisting of unconfined compression, unconsolidated triaxial compression and Atterberg limit determinations on selected undisturbed soil samples. Other testing included consolidation testing, gradation tests (where applicable), and moisture content.

Design

6. Provided recommendations for embankment fill. We also provided recommendations for site preparation and structural fill placement including criteria for clearing, stripping, and grubbing; guidance for preparing the subgrade soil, and criteria for structural fill placement and compaction.

7. Provided guidance for selection of retaining wall type.

8. Provided recommendations for design and construction of deep foundation support of the following structures:
   - Picardy to Perkins Connector Bridge over Dawson Creek
   - Backcourt Drive Bridge over Dawson Creek
   - Railroad overpass structure

9. Provided pavement design recommendations.

10. Provided recommendations for foundations to support the privacy walls.

SITE CONDITIONS

General

We developed an understanding of site subsurface conditions by review of published geologic resources and our explorations (B-1 through B-17, and B-20 through B-33) completed during the project. GeoEngineers contacted Louisiana One-Call to clear utilities for field investigation. The approximate locations of our explorations are presented in the Boring Location Plan, Figures 3A and 3B. As-drilled boring locations (coordinates) and ground elevations at the borings were determined by land surveyors from Evans-Graves.

ATTACHMENT B

Geology

The United States Army Corps of Engineers (USACE), as shown by the Geologic Map of the Baton Rouge Quadrangle, maps the site as Natural Levee and Pleistocene Prairie Terrace. These deposits generally consist of clay, silty clay, and silt, approximately as shown on the Area Geology Map, Figure 4.

Surface Conditions

Picardy to Perkins Connector Bridge over Dawson Creek

The proposed alignment of the Picardy to Perkins Connector Bridge will mostly occupy currently undeveloped property. The plans by Evans-Graves and field observations indicate an existing pedestrian walkway and bridges near the proposed location at the Swaggart Ministries property. The land between Perkins Road and Dawson Creek and the property along the banks of Dawson Creek are wooded. The remaining land is mostly open. Elevation differences along the creek bank indicate the possibility of spoil deposits from previous creek excavations/shaping. The elevation of the ground varies; on the southern approach the elevation is about 20 feet (EL 20 ft), the minimum elevation of the creek bottom (mud line) recorded by Evans-Graves is EL 3.75 ft, and the maximum elevation at the northern bridge approach is about EL 25 ft. The mud line observed at the soil boring location in Dawson Creek was less than 1 foot below the water surface at the time of drilling.

Backcourt Drive Bridge over Dawson Creek

Based on plans by Evans-Graves and visual observation, the proposed bridge over Dawson Creek on Backcourt Drive will be built on undeveloped property and connect to an existing residential street. An existing private path runs parallel to the creek near this location. The existing ground surface on the north approach of the bridge is about EL 18.6 ft and on the south approach is about EL 21.4 ft. The minimum elevation of Dawson Creek reported by Evans-Graves is about EL 4 ft. During field explorations, approximately 6 inches of water was observed at the boring location within the creek.

Railroad Overpass Structure

Based on plans by Evans-Graves and visual observation, the Kansas City Southern (KCS) Railroad mainline is at a higher elevation than the surrounding area. To the west of the rail line, the existing ground elevation is between EL 17 ft and EL 22 ft. There is a steep ditch that bottoms at EL 9 ft before the ground surface elevation increases again to the railroad alignment about EL 30.5 ft. East of the railroad another steeply side-sloped ditch has a minimum elevation of EL 12 ft. East of the ditch, the ground elevation is between EL 29.5 ft and EL 32 ft. The alignment of the proposed roadway underpass is currently undeveloped. A private path runs parallel to the railroad on the western side of the tracks.

Privacy Walls

The site is located within a mixed-use area, including residential and commercial properties bordering the proposed Picardy to Perkins Connector. A privacy wall is proposed along the alignment for the new roadway, and will be constructed along partially undeveloped land between Perkins Road and Dawson Creek.

Subsurface Conditions

General

Soil and groundwater conditions at the site were explored in two different mobilizations to the site due to delays in obtaining one of the property access agreements. The first drilling activities took place between September 10th and 20th, 2013. Borings B-1 through B-8 along the proposed connector and privacy wall alignment were drilled. The first mobilization for drilling also made use of easier access to boring locations along the existing Mall of Louisiana and adjacent property development for B-20 through B-27 and B-31 at the Backcourt Drive Bridge. The second mobilization was a combination of ATV-mounted drilling and marsh buggy-mounted drilling, taking place between January 6th and 19th, 2014. The boring locations were B-9 through B-17, B-28 through B-30, B-32, and B-33. The second mobilization borings were at locations along the proposed bridge alignments and railroad alignment.

The depth of the soil borings varied across the site. The borings along the privacy wall alignment (B-1 through B-10) were drilled to about 20 feet below existing ground surface (bgs). The borings for the bridges over Dawson Creek, B-11 through B-13 and B-31 through B-33, were drilled to about 120 feet bgs. The railroad alignment borings, B-28 through B-30, were also drilled to about 120 feet bgs. At the proposed underpass wall location, B-14 through B-17 were drilled to 60 feet bgs, borings 20 and 21 were drilled to 120 feet bgs, and borings B-22 through B-27 were drilled to 30 feet bgs.

The approximate exploration locations are shown on Figures 3A and 3B. Representative soil samples from the boring explorations were returned to our laboratory for review and testing. Detailed descriptions of our site exploration and laboratory testing programs along with exploration logs and laboratory test results are presented in Appendix A.

Picardy to Perkins Connector Bridge over Dawson Creek

The soil boring locations B-11 and B-13 began at the ground surface at about EL 19 ft. Boring B-12 began at the mud line below about 6 inches of water at EL 3.7 ft. The soil samples along the bridge alignment, B-11, B-12, and B-13, (South to North) were medium stiff to stiff clay and silty clay with some clayey silt to about EL -20 ft. B-11 and B-13 show similar soil layering between EL -20 ft and EL -80 ft, varying between stiff and very stiff clay. A soft layer of very silty clay was observed in B-13 below EL -80 ft, followed by a layer of medium dense sand. Sand was observed in B-11 below EL -80 ft. The boring in the creek, B-12, showed much more layering and variability. A silty clay ranged from medium to very stiff between the mud line and EL -17 ft. The soil then alternated in layers of clay, silty clay, and silt. The strength of the soil improved slightly with depth in all the borings. A design profile of the shear strength and unit weight of the soils was developed and is included in Appendix A.

Backcourt Drive Bridge over Dawson Creek

The soil samples collected along the alignment of the Backcourt Drive Bridge were B-31, B-32, and B-33 (East to West). The boring at the lowest ground surface elevation was B-32 (EL 3.6 ft), and samples were collected at significantly higher elevation for B-31 (EL 22 ft) and B-33 (EL 27.5 ft). Medium to very stiff clay with varying sand and silt content was encountered to about EL -16 ft in B-31. This layer was followed by stiff to very stiff clay layers. A layer of medium stiff silt was encountered at about EL -70 ft, followed by more very stiff clay. Layering of soils at B-33 was similar to that at B-31. The strength of the upper layers was less, a soft silty clay was encountered at about EL 0 ft. Medium to hard clay and clay with silt layers continued to approximately EL -82 ft, where a medium dense layer of sand was encountered, underlain by clay. The sampling at the center boring, B-31, began at the mud line; six inches of water stood above the ground surface in Dawson Creek. The stiff to very stiff clay with silt and very silty clay continued to about EL -20 ft. Stiff and very stiff clay was encountered to about EL -60 ft. The strength of the soil then decreased from very stiff to medium stiff silty clay, and at EL -80 ft a soft layer of silt was encountered. Below about EL -85 ft, the clay increased in strength. A design profile of the shear strength and unit weight of the soils was developed and is included in Appendix A.

Railroad Overpass Structure

The soil samples collected near the alignment of the KCS Railroad were B-28, B-29, and B-30 (East to West). The ground surface varied between EL 21.9 ft and EL 22 ft at the different locations. Clay with silt was encountered in all borings from the ground surface to about EL 12 ft. The strength of this layer varied with soft material at B-28, and higher strength material at B-29. At B-29 and B-30, stiff to very stiff clay was encountered to about EL -50 ft. A layer of clay with silt was encountered between EL -50 ft and EL -60 ft in B-29 and B-30. Medium to very stiff strength clay and clay with silt layers were sampled for the remaining depth of both borings. The boring at B-28 varied slightly with a soft layer of clay encountered at about EL 2 ft, and a layer of clay with silt observed at EL -28 ft. The clay between EL -28 ft and El -75 ft was very stiff to hard in strength. Additional layering with clay, clay with silt, and sand began at EL -75 ft. A design profile of the shear strength and unit weight of the soils was developed and is included in Appendix A.

Privacy Walls

The proposed location of privacy walls along the alignment for the new roadway extends along the length of the site between Perkins Road and Dawson Creek, approximately between soil sample locations B-3 through B-8. Soil borings generally encountered medium to very stiff clay; the silt content and plasticity of the soil varied. The design soil profile for the privacy wall section is presented in Appendix A.

Groundwater

Although groundwater was encountered at varying depths in our borings, for design and construction the groundwater level (saturated zone) should be expected at the ground surface.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on our site exploration, laboratory testing, and engineering analysis, we believe the proposed bridges can be supported on deep foundations. The privacy walls may be supported on shallow spread footing foundations or on drilled shaft foundations. Also, several types of retaining walls may be selected below the railroad overpass, or a portion may be sloped without walls, if appropriate. The following sections present our specific conclusions and recommendations.

Site Preparation

Wet Weather Conditions

An important factor in preparing the site for construction is to first establish drainage in the upper soils. If not properly managed, site drainage will dictate construction schedule and foundation performance.

Accordingly, we recommend that the natural ground surface be graded to drain surface water away from proposed structures and pavement areas. Foundation soil, pavement subgrade and utility trench backfill should be compacted to the requirements discussed below to reduce potential for settlement and collection of surface water.

During wet weather, site drainage should be managed with the use of drainage channels, if necessary. If needed to facilitate drainage, water also should be pumped with a sump at the bottom of excavations in clay to keep surfaces dry. However, for excavations during extended periods of heavy precipitation, temporary dewatering using a continuous sump pump system may be required to keep water off the excavation bottom.

As noted previously, we encountered clays with high to moderate plasticity at the ground surface throughout the site. Accordingly, trafficability of construction equipment at the site could be difficult during wet weather conditions. Furthermore, if earthwork is attempted during wet weather, the surficial 2 to 3 feet of clay soil will become saturated and soft, thus requiring costly and time-consuming rehabilitation efforts.

Depending on the weather conditions, traffic, schedule and area when site work begins, the surface soils encountered at the site could benefit from modification to improve trafficability. One or more of the following measures may be considered to reduce the potential for degradation of the surficial soils:

- Site grading for drainage control;
- Mechanical improvement from compactive action;
- Chemical stabilization, as discussed below; and/or
- Construction roadways and laydown areas of crushed limestone over geotextile fabric.

These improvements could be required not only to achieve the desired foundation performance, but also to commence and execute construction activities, and allow traffic over the site in wet weather conditions.

Initial Preparation

Initial site preparation will include: clearing, stripping and grubbing; grading and/or excavation to establish proposed subgrade elevations; and excavation for proposed utilities and foundations. The area to be developed should be stripped of all old foundations, debris, vegetation, existing concrete or asphalt pads and otherwise unsuitable material, and then excavated down to proposed grades.

Subgrade Preparation

After stripping and excavation operations are complete, soil exposed should be proof-rolled with a 10-kip (approximately 1-kip-per-lineal-foot) roller or a half-loaded dump truck to identify soft, wet, unstable or other areas of unsuitable soil within the working subgrade. Probing should be used to evaluate the subgrade during periods of wet weather or if access is not feasible for compaction equipment. Any soft, loose or otherwise unsuitable areas identified during proof-rolling should be recompacted if practical, stabilized using agents such as lime, or removed and replaced with imported structural fill. We recommend that subgrade proof-rolling be observed by a representative of our firm to evaluate the adequacy of the subgrade conditions and to identify areas needing additional effort.

ATTACHMENT B

Surface Stabilization

After the site is adequately drained and had subgrade preparation, compaction and other earthwork may begin. Chemical treatment may be necessary to achieve a working surface. Generally, soil with a Plasticity Index (PI) less than 15 can be stabilized with lime or cement. Soil with a PI between 15 and 25 can usually be lime stabilized, and cement stabilized after pretreatment with lime. Other factors, such as previous exposure of the soil to chemicals – pesticides or fertilizers – can affect the soil's acceptance of lime or cement. However, because some of the surficial soils at the site are moderate to high plasticity clays (CH) (PI of about 25 or greater), lime treatment is an option both as a drying agent and to help develop a stable working surface, possibly in conjunction with cement.

Structural Fill

Both imported fill and on-site borrow soil used as structural fill should be free of debris and organic contaminants. Depending on the intended use, structural fill should meet the specifications described below:

- Structural fill placed below foundations should be low-plasticity clay (CL) with a liquid limit (LL) between 20 and 45, and a PI between 10 and 32, in conformance with "Usable Soils or Select Soils" as described in Section 203 "Excavation and Embankments" of the LADOTD Specifications. The fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness, or less if necessary to obtain adequate compaction. Each lift should be thoroughly and uniformly moisture-conditioned to within 3 percent of the optimum moisture content. Structural fill placed beneath structures should be compacted to at least 90 percent of the maximum dry density (MDD) as determined by the ASTM International (ASTM) D1557 laboratory test procedure (modified Proctor).
- Alternatively, crushed stone may be placed to establish a working pad. Material placed as crushed stone base course below foundations should meet LADOTD Standard Specification Section 302 "Stone Base Course" or locally available crushed stone commonly referred to as "610 Gradation". Sand should not be used under foundation elements. Crushed stone layers should be compacted to at least 95 percent of the MDD (ASTM D1557) or 80% relative density (ASTM D4252 and ASTM D4253).

Structural fill placed to support a foundation should be placed and compacted a minimum distance of 5 feet beyond the footprint of the foundation. Full-time earthwork monitoring and a sufficient number of in-place density tests should be performed by GeoEngineers to evaluate fill placement and compaction operations, and to confirm that the required compaction is being achieved.

Cut and Fill Slopes

Temporary cut slopes will be necessary during grading, utility installation and foundation excavation operations. The contractor is responsible for construction site safety and should monitor slopes during earthwork in accordance with applicable Occupational Safety and Health Administration (OSHA) regulations.

Based on our exploration and laboratory testing information, we believe that slopes inclined at 1.5H:1V (horizontal to vertical) or flatter may be used for temporary cuts of 10 feet or less. This recommendation assumes that all surface loads are kept a minimum distance of at least ½ the depth of the cut away from the top of the slope. Accordingly, heavy construction equipment, construction materials or soil stockpiles should not be located near the top of any excavation. Flatter slopes will be necessary if surface loads are imposed above the cuts a distance equal to or less than ½ the depth of the cut. Any silt or sand streaks and lenses encountered in the sides of the excavation should be protected with filter fabric and stone or gravel to prevent the loss of material bleeding into the excavation.

We recommend a maximum inclination of 3H:1V for permanent cut and fill slopes. Surface drainage should be directed away from slope faces. Some raveling could occur with time. All slopes should be covered with topsoil and seeded as soon as possible after earthwork operations are complete to encourage the development of a vegetative cover, or covered with other erosion protection materials.

Retaining Walls

General

A retaining wall is a structure designed and constructed to resist the lateral pressure of soil when there is a desired change in ground elevation that exceeds the angle of repose of the soil. In order to construct the Picardy to Perkins Connector roadway underpass below the railroad, a retaining wall or cut slope will be needed. We understand that the retaining wall type will be selected during a later phase of design after more of the variables are determined such as right-of-way, construction sequencing, and budget.

Depending on some of the project and design variables, there are various walls that could be used to successfully support the expected road cuts. One or more of the following measures may be considered to retain the expected cuts:

- Cut slopes without walls;
- Mechanically stabilized earth (MSE) walls;
- Soil nail walls; and/or
- Sheet pile walls.

The following sections present some basic elements to consider for each of these types of retaining walls.

Cut Slopes without Walls

Cut slopes without retaining walls should be the least expensive option to allow for the new Picardy to Perkins Connector roadway to extend beneath the railroad. However, this option would require a significant amount of right-of-way, and may interfere with utilities and other features on adjacent properties. As mentioned previously, we recommend a maximum inclination of 3H:1V for permanent cut slopes. Therefore, the required right-of-way would be a minimum of 3 times the cut depth on each side of the roadway.

Alternatively, a combination of cut slope and retaining wall could be used where the sides are sloped back for some distance near the top of the wall, and then retaining walls are constructed for the bottom portion of the cut to reduce the required right-of-way.

MSE Walls

MSE walls are bottom-up constructed retaining walls that utilize soil constructed with artificial reinforcing that is tied to a wall facing. The wall face is often of precast, segmental blocks, panels or geocells that can tolerate some differential movement. The walls are infilled with imported granular soil, with or without reinforcement, while retaining the backfill soil. Reinforced walls utilize horizontal layers typically of geogrid reinforcement. These geogrids provide added internal shear resistance beyond that of simple gravity wall structures. Other options for reinforcement include steel straps, also layered. The reinforced soil mass, along with the facing, forms the wall. In many types of MSE wall, some vertical fascia rows are inset, thereby providing individual cells that can be infilled with topsoil and planted with vegetation to create a green wall.

The wall face is often of precast concrete units that can tolerate some differential movement. The reinforced soil's mass, along with the facing, then acts as an improved gravity wall. The reinforced mass must be built large enough to retain the pressures from the soil behind it. MSE wall reinforcement usually must be about 75 percent as deep or thick as the height of the wall, and may have to be larger if there is a slope or surcharge above the wall. Additionally, an MSE wall would require a temporary cut slope of 1.5H:1V behind the reinforcement. This required right-of-way would be a minimum of 2.25 times the cut depth on each side of the roadway.

The main advantages of MSE walls compared to conventional reinforced concrete walls are their ease of installation and quick construction. They do not require formwork or curing and each layer is structurally sound as it is laid, reducing the need for support, scaffolding or cranes. They also do not require additional work on the facing. However, MSE walls require imported backfill consisting of well-graded clean sand and drainage rock behind the wall face.

Soil Nail Walls

Soil nail walls are top-down constructed retaining walls that involve the insertion of relatively slender reinforcing elements into the slope – often general purpose steel reinforcing bars (rebar) although proprietary solid or hollow-system bars are also available. Solid bars are usually installed into pre-drilled holes and then grouted into place using a separate grout line, whereas hollow bars may be drilled and grouted simultaneously by the use of a sacrificial drill bit and by pumping grout down the hollow bar as drilling progresses. Kinetic methods of firing relatively short bars into soil slopes have also been developed. Bars installed using drilling techniques are usually fully grouted and installed at a slight downward inclination with bars installed at regularly-spaced points across the slope face. A rigid facing (often pneumatically applied concrete, otherwise known as shotcrete) or isolated soil nail head plates may be used at the surface. Alternatively a flexible reinforcing mesh may be held against the soil face beneath the head plates. A final wall facing is added after the excavation is complete.

The main advantages of soil nail walls compared to conventional retaining walls are that the excavation may be clean cut immediately at the wall face without any additional excavation, or any construction or right-of-way behind the wall. Although, you would need a permit from the adjacent property owner for the soil nail locations stating that there would be no future excavations in the area to disturb the nails. Thus, the wall is constructed from the top and immediately supports the sides as the excavation proceeds down. However, soil nail walls do require a specialty contractor and are generally more expensive than standard retaining walls.

Sheet Pile Walls

Sheet pile retaining walls are usually used in soft soils and tight spaces. Sheet pile walls are made out of steel, vinyl or wood planks which are driven into the ground. For a quick estimate the material is usually driven 1/3 above ground, 2/3 below ground, but this may be altered depending on the environment. Taller sheet pile walls will need either a tie-back anchor, or "dead-man" placed behind the potential failure plane in the soil behind the face of the wall, that is tied to the wall, usually by a cable or a rod. Technically complex, this method is very useful where high loads are expected, or where the wall itself has to be slender and would otherwise be too weak.

Similar to a soil nail wall, a top-down anchored sheet pile wall would be appropriate to support the excavation adjacent to and below the railroad overpass structure.

Foundation Support

Safety Factors (SF)

SF for Bridges over Dawson Creek

We understand that LRFD methodology will be used for the design of the Picardy to Perkins Connector Bridge over Dawson Creek and the Backcourt Drive Bridge over Dawson Creek. Accordingly, recommendations for these bridges are based on the guidelines presented in the 2012 AASHTO LRFD Bridge Design Specifications, 6th Edition with 2013 Interim Revisions.

LRFD Table 10.5.5.2.3-1 recommends a downward capacity resistance factor of 0.45 for pile foundations founded in cohesionless soil (silt, sand, and gravel) and 0.35 for cohesive soil (clay) if no pile testing is completed. Because our borings indicated the piles will be driven through primarily cohesive soils, we recommend a downward capacity resistance factor of 0.35 be used for pile design if no pile testing will be completed during construction. Alternatively, if dynamic testing with signal matching at BOR (Beginning of Restrike with 24-hour restrike and CAPWAP) is completed, then LRFD Table 10.5.5.2.3-1 recommends a downward capacity resistance factor of 0.65 for redundant pile foundations (3 or more per bent). If dynamic testing is chosen, LRFD Table 10.5.5.2.3-1 recommends testing at least two percent of the production piles. Accordingly, because of the relatively small number of piles, we recommend completing at least one dynamic test with signal matching at each bridge.

SF for Railroad Overpass Structure

The railroad design specifications should conform to those of KCS and AREMA Manual for Railroad Engineering specifications. Accordingly, GeoEngineers recommends safety factors selected for design of the railroad overpass conform to the more stringent of KCS or AREMA standards.

Downward Pile Capacity

GeoEngineers evaluated downward axial pile capacities for the composite soil profile using the computer program DRIVEN Version 1.2, published by the Federal Highway Administration (FHWA). The DRIVEN program utilizes the Norlund and Tomlinson’s Alpha methods to calculate pile resistance for cohesionless and cohesive soil, respectively.

The pile capacities are based on the piles being in single rows and spaced at least three pile diameters apart. If pile groups with multiple rows are considered, please contact GeoEngineers for guidance for calculating pile group capacity for vertical loads and/or a reduction factor.

ATTACHMENT B

Pile Capacity for Picardy to Perkins Connector Bridge over Dawson Creek

GeoEngineers understands that driven piles will be used to support the proposed Picardy to Perkins Connector Bridge. Accordingly, downward pile capacities for the bridge design and pile sections being considered were evaluated. These include:

- 16-inch driven square precast prestressed concrete (PPC) piles
- 24-inch driven square precast prestressed concrete (PPC) piles

The pile capacities were computed as ultimate values so that the designer may select the most appropriate resistance factor based on final design and testing criteria. The elevation of the mud line was lowered by 5 feet from its existing elevation for scour. No pile capacities above the creek scour elevation were considered.

The ultimate downward capacities for 16-inch and 24-inch driven PPC piles are provided in Figure 5. If no pile testing is completed, the required ultimate load is 486 Tons (170-Ton strength load / resistance factor of 0.35) for LRFD design. The pile capacity chart (Figure 5) indicates that capacity is obtained only in the 24-inch concrete piles and at a pile tip elevation of EL -114 ft. The capacity in the 16-inch PPC piles may be obtained when the pile tip is beyond the extent of the boring termination elevation. Alternatively, if dynamic testing is completed as discussed above, the pile capacity chart (Figure 5) indicates that capacity is obtained at a pile tip elevation of about EL -68 ft for the 24-inch concrete pile and at pile tip approximate EL -98 ft for the 16-inch concrete pile based on an ultimate load of 262 Tons (170-Ton strength load / resistance factor of 0.65).

Pile Capacity for Backcourt Drive Bridge over Dawson Creek

Driven piles will be used to support the proposed Backcourt Drive Bridge over Dawson Creek according to plans by Evans-Graves. Accordingly, downward pile capacity for the bridge design and pile section being considered was evaluated. The analyzed section is:

- 24-inch driven square precast prestressed concrete (PPC) piles

The pile capacities were computed as ultimate values so that the designer may select the most appropriate resistance factor based on final design and testing criteria. The elevation of the mud line was lowered by 5 feet from its existing elevation for scour. No pile capacities above the creek scour elevation were considered.

The ultimate downward capacities for 24-inch driven PPC piles are provided in Figure 6. If no pile testing is completed, the required ultimate load is 458 Tons (160-Ton strength load / resistance factor of 0.35) for LRFD design. The pile capacity chart (Figure 6) indicates that capacity is obtained at a pile tip of EL -105 ft. Alternatively, if dynamic testing is completed as discussed above, the pile capacity chart (Figure 56) indicates that capacity is obtained at a pile tip elevation of about EL -50 ft for the 24-inch concrete pile based on an ultimate load of 246 Tons (160-Ton strength load / resistance factor of 0.65).

Pile Capacity for Railroad Overpass Structure

GeoEngineers understands that driven piles will be used to support the proposed railway structure over the Picardy to Perkins Connector. The downward pile capacity and uplift pile capacity for the structure design and pile section being considered was evaluated. The pile section analyzed is:

- HP 14x73 steel piles

The pile capacities were computed as ultimate values so that the designer may select the most appropriate resistance factor based on final design and testing criteria. GeoEngineers recommends using design criteria that conforms to KCS and AREMA Manual for Railroad Engineering specifications. The ultimate downward and uplift capacities for HP 14x73 steel piles are provided in Figure 7.

Other Pile Considerations

These piles driven into clay are friction-type piles, deriving their capacity primarily from adhesion of the soil on the sides of the pile. Consequently, the piles should be driven with an air hammer or diesel hammer that has sufficient energy to drive the piles their full design length into the ground.

Pile capacities given are based only on the support capacity of the subsoil. The structural engineer must determine the capacity of the pile element.

Installation practices for deep foundations are critical and should be monitored by a qualified technician. GeoEngineers has senior technicians qualified to perform these activities.

Privacy Walls

GeoEngineers understands that the privacy walls may be supported on either drilled shaft foundations or on spread footings. The capacities and construction considerations of each option are presented below.

Drilled Shafts for Privacy Walls

The drilled shaft capacities are based on the shafts being in single rows and spaced at least three diameters apart. Drilled shafts are assumed to behave as friction piles, and the end bearing contribution to capacity is neglected. An assumed footing/shaft cap embedment of 3 feet was used during calculations. The drilled shaft diameters that were analyzed are:

- 12-inch diameter drilled shaft
- 18-inch diameter drilled shaft
- 24-inch diameter drilled shaft

The ultimate shaft capacities are shown in Figure 8. We recommend a safety factor of 3 be applied to these ultimate loads unless a shaft load test is performed. Additional information about drilled shafts is included in Appendix B.

Shallow Foundation Support and Settlement for Privacy Walls

We recommend that soil exposed at proposed foundation grade be prepared as recommended in the **Site Preparation** section of this report. To provide uniform bearing conditions and to reduce the potential for excessive total and differential foundation settlement, **uncontrolled fill must be removed from below the foundation footprint.** Depending on proposed finished foundation subgrade relative to existing site elevations, shallow foundations constructed for support of the proposed privacy walls may be constructed either on on-site medium to stiff variable-plasticity clay or structural fill overlying this clay. We further recommend that an experienced geotechnical engineer or technician observe soil conditions at proposed foundation grade to confirm that suitable bearing soil has been exposed and prepared as recommended above, or provide recommendations for over-excavation and replacement with structural fill as necessary and appropriate.

Individual and continuous footings should be designed with minimum dimensions of 24 and 18 inches, respectively. We further recommend that proposed foundations be constructed at a depth of at least 12 inches below the nearest adjacent exterior finished grade.

The net allowable bearing pressures along the alignment west of Dawson Creek in the area of borings B-1 through B-8 only, are 2,000 psf for individual shallow spread footings and 1,500 psf for long footings with length to width greater than 2. Footings placed on compacted structural fill with subgrade preparation as described in this report may be designed using these same net allowable bearing pressures. These allowable bearing pressures include a factor of safety of at least 2. Examples of estimated settlements are in Table 1 below.

TABLE 1. ESTIMATED SETTLEMENTS

Footing Size	Sustained Load (kips)	Allowable Bearing Pressure (psf)	Estimated Settlement (in)
4' x 4'	32	2,000	< ½
8' x 8'	128	2,000	< ¾
10' x 10'	200	2,000	< 1

As much as 50 percent of the total settlement for shallow foundation may occur during initial construction and loading. The remaining settlement should be mostly complete within a year, provided the load remains constant. However, loose soil not removed from footing excavations or disturbance of soil at foundation grade during construction could result in larger settlements than estimated. We should be contacted if the assumptions stated herein do not reflect final design.

Pavement Design

General

We completed pavement thickness design in general accordance with AASHTO design procedures and using the computer program WinPAS. Flexible hot mix asphalt (HMA) and rigid Portland cement concrete (PCC) pavements were evaluated. The following assumptions and input parameters were used in our design analyses:

- Based on encountered subgrade soil conditions and correlations with resilient modulus, we estimate that the existing subgrade soils should have a resilient modulus (M_R) value of about 4,900 pounds per square inch (psi).
- Approximately 4,377,750 equivalent single-axle loads (ESALs) for HMA pavement design; and 6,192,656 ESALs for PCC pavement design. These ESAL values are based on a projected 20-year design life, and average daily traffic (ADT) loads of 11,561 automobiles per day (2012 ADT) with 2 percent trucks, growing to an ADT of 15,375 in 2032. For design purposes, we assumed a directional distribution of 100 percent.

- A reliability of 95 percent based on urban collector roadways in accordance with AASHTO.
- A standard deviation of 0.45 for HMA and 0.35 for PCC based on new construction in accordance with AASHTO.
- In accordance with AASHTO, the modulus of rupture of the rigid pavement is 650 psi and the modulus of elasticity is 4,400,000 psi.
- An initial serviceability index of 4.0 and a terminal serviceability index of 2.5 based on collector streets in accordance with AASHTO.
- In accordance with AASHTO, the following material factors were used in our HMA analyses: 0.44 for HMA, 0.14 for crushed stone base course (CSBC), and a drainage coefficient of 0.8 for both HMA and CSBC based on fair drainage conditions.
- The following material properties were used in our PCC design: resilient modulus of the subgrade of 4,900 psi, resilient modulus of the base of 20,000 psi, and a modulus of subgrade reaction of 267 psi/inch.
- The design of the PCC pavement presumed a load transfer coefficient of 3.2 based on dowel connections at the joints and no pavement edge support.

Pavement Thickness

Based on the results of our analyses, and provided pavement subgrade soil is prepared as recommended herein, our recommended HMA flexible pavement section and PCC rigid pavement section are presented in Table 2 and Table 3 below.

TABLE 2. FLEXIBLE, HOT MIX ASPHALT (HMA) PAVEMENT DESIGN

Layer Material	Layer Thickness (inches)
HMA	6
CSBC	21

TABLE 3. RIGID, PORTLAND CEMENT CONCRETE (PCC) PAVEMENT DESIGN

Layer Material	Layer Thickness (inches)
PCC	10
CSBC	8

As noted previously, the crushed stone material should be compacted to at least 95 percent of the MDD (ASTM D1557) or 80 percent relative density (ASTM D4252 and ASTM D4253). Furthermore, we recommend that a separation fabric be placed between on-site soil and the crushed stone to reduce potential for the clay to disturb the base course. Note also that our explorations at the Mall of Louisiana encountered 10 inches of PCC pavement.

ATTACHMENT B

LIMITATIONS

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers for their design of the Picardy to Perkins Connector and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form or hard copy of this document (email, text, table, and/or figure), if provided, and any attachments are only a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix C titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

We appreciate the opportunity to work with you on this project. If you have any questions regarding this report, or if you need additional information, please call.

ATTACHMENT B

FIGURES

GeoEngineers

ATTACHMENT B

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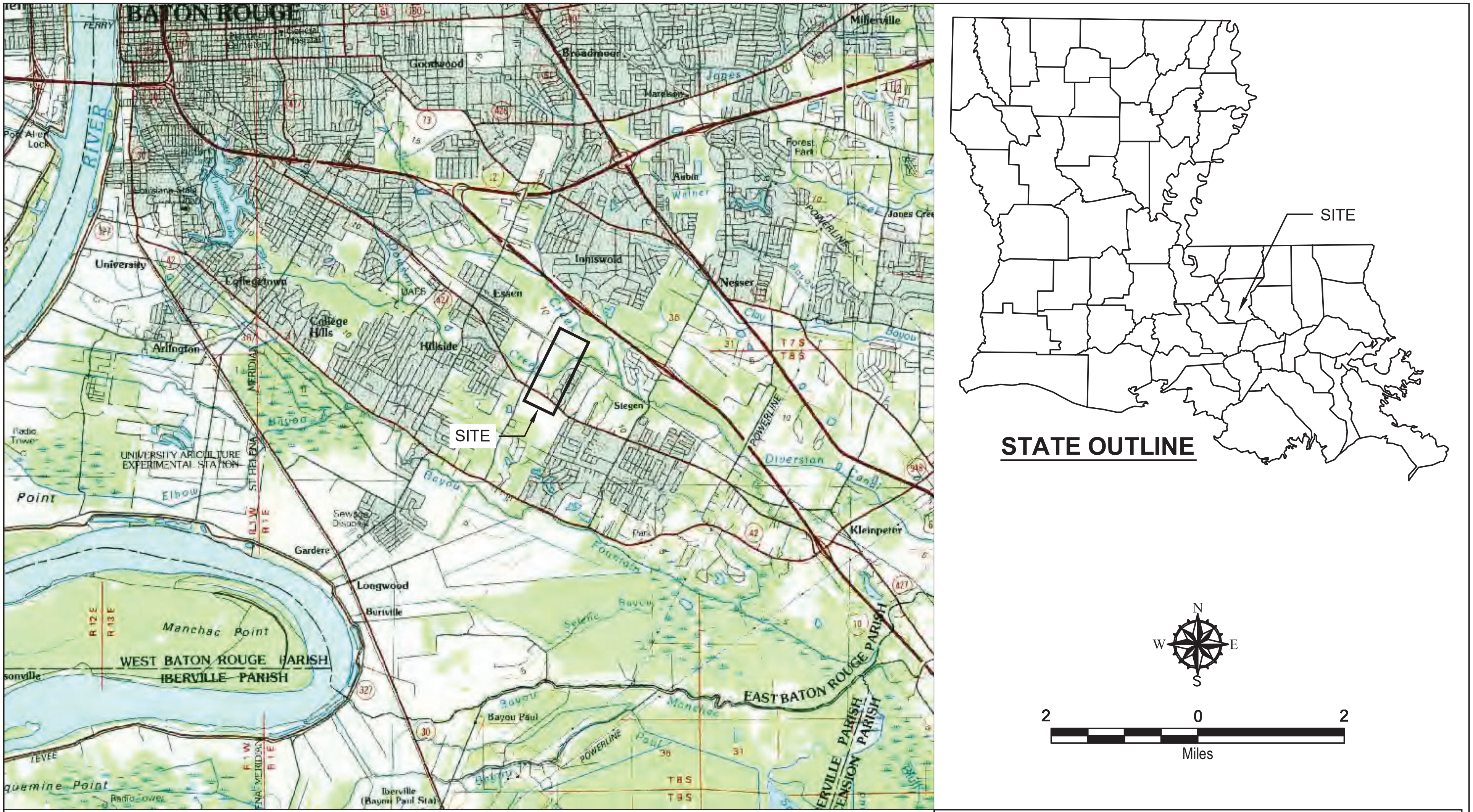
IAH : KMC



VICINITY MAP

Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Topographic image was taken from USGS, 100K Template, Quad: Baton Rouge, Dated 1983

ATTACHMENT B

Notes:
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Reference: 1. Aerial image was taken from Google Earth Pro., Licensed to GeoEngineers Inc., Imagery Dated: 1/19/2013
2. Base drawing was provided by Evans-Graves Engineers, ACAD-2011-12500xdesign with bike path.dwg, Dated: 2/27/2014

W N E S

600 0 600
FEET

PROJECT SITE PLAN

Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 2

P:\16\1671005\100\CAD\12500xdesign with bike path_ACAD2007.dwg\TAB:Check 24X36 modified on May 22, 2014 - 1:32pm

IAH : KMC

ATTACHMENT B

P:\16\16710051\00\CAD\Boring Location Plan.dwg\TAB:Layout1 (3) modified on May 20, 2014 - 2:50pm

GA : KMC

BORING DETAILS

BORING #	LATITUDE	LONGITUDE	DEPTH (FT)
B-1	N30° 22' 36.60"	W91° 05' 32.60"	20'
B-2	N30° 22' 38.70"	W91° 05' 31.60"	20'
B-3	N30° 22' 41.27"	W91° 05' 29.54"	20'
B-4	N30° 22' 43.80"	W91° 05' 28.60"	20'
B-5	N30° 22' 45.60"	W91° 05' 27.70"	20'
B-6	N30° 22' 46.70"	W91° 05' 26.40"	20'
B-7	N30° 22' 49.00"	W91° 05' 25.30"	20'
B-8	N30° 22' 51.40"	W91° 05' 25.00"	20'
B-9	N30° 22' 58.60"	W91° 05' 24.20"	20'
B-10	N30° 23' 01.70"	W91° 05' 19.40"	20'
B-11	N30° 22' 51.82"	W91° 05' 25.80"	120'
B-12	N30° 22' 52.80"	W91° 05' 24.30"	120'
B-13	N30° 22' 55.30"	W91° 05' 24.60"	120'
B-14	N30° 23' 05.30"	W91° 05' 17.30"	60'
B-15	N30° 23' 04.70"	W91° 05' 16.20"	60'
B-16	N30° 23' 06.30"	W91° 05' 16.40"	60'
B-17	N30° 23' 05.60"	W91° 05' 16.10"	60'
B-31	N30° 23' 11.00"	W91° 05' 11.40"	120'
B-32	N30° 22' 59.59"	W91° 05' 16.20"	120'
B-33	N30° 23' 00.40"	W91° 05' 17.10"	120'

Legend

◐ B-1	Boring Location

N
W E
S

600 0 600
Feet

Notes:
1. The locations of all features shown are approximate.
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Reference: Aerial image was taken from Google Earth Pro., Licensed to GeoEngineers Inc., Imagery Dated 1/19/2013

BORING LOCATION PLAN

Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 3A

ATTACHMENT B

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IAH : KMC

BORING DETAILS			
BORING #	**LATITUDE**	**LONGITUDE**	**DEPTH (FT)**
B-20	N30° 22' 09.60"	W91° 05' 14.50"	120'
B-21	N30° 23' 09.00"	W91° 05' 13.40"	120'
B-22	N30° 23' 09.90"	W91° 05' 14.60"	30'
B-24	N30° 23' 11.00"	W91° 05' 11.40"	30'
B-25	N30° 23' 10.30"	W91° 05' 11.50"	30'
B-26	N30° 23' 09.80"	W91° 05' 16.30"	30'
B-27	N30° 23' 10.40"	W91° 05' 15.40"	30'
B-28	N30° 23' 06.60"	W91° 05' 14.90"	120'
B-29	N30° 23' 07.20"	W91° 05' 15.40"	120'
B-30	N30° 23' 07.80"	W91° 05' 17.10"	120'

Legend

◐ B-21	Boring Location

N
W E
S

100 0 100
Feet

Notes:
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Reference: Aerial image was taken from Google Earth Pro., Licensed to GeoEngineers Inc., Imagery Dated 1/19/2013

BORING LOCATION PLAN

Picardy to Perkins Connector
Baton Rouge, Louisiana

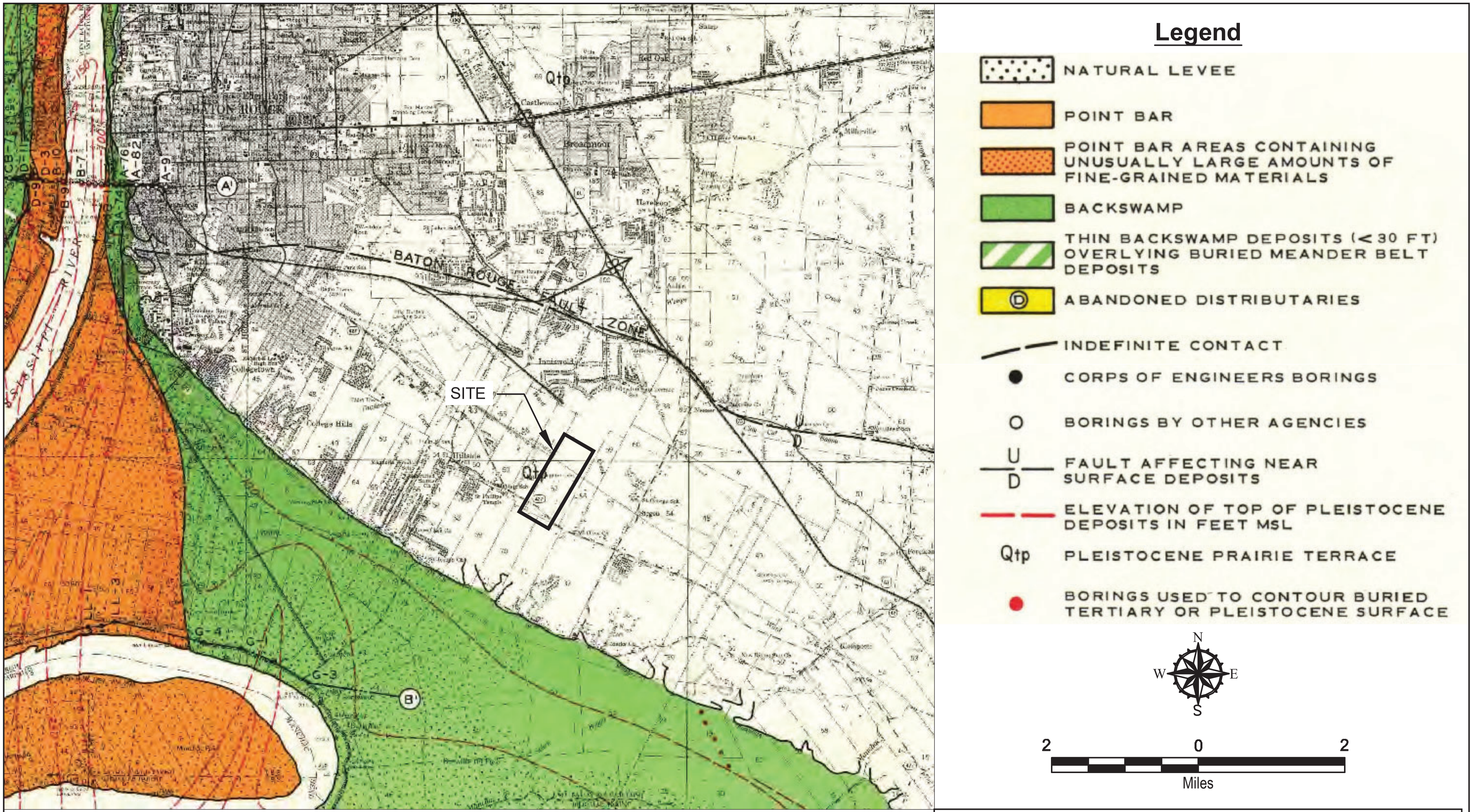
GEOENGINEERS

Figure 3B

ATTACHMENT B

P:\16\16710051\00\CAD\Area Geology Map.dwg\TAB:Layout1 modified on May 22, 2014 - 1:21pm

IAH : KMC



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Geology map was taken from USACE, Alluvial Deposits Map, Quad: Baton Rouge, Dated 1982

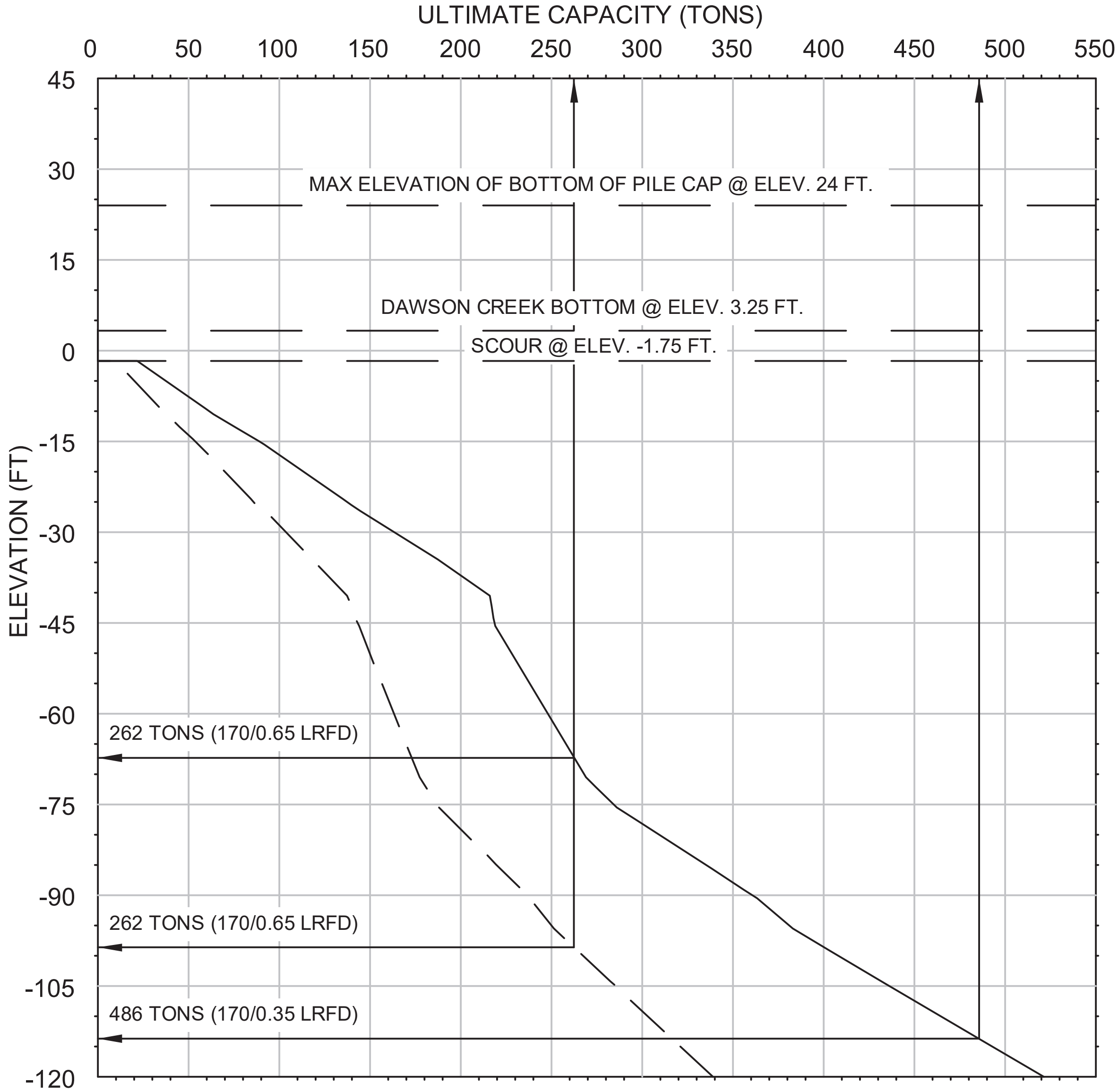
AREA GEOLOGY MAP

Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 4

ATTACHMENT B



LEGEND

— —	16-inch Precast Concrete Pile
——	24-inch Precast Concrete Pile

ULTIMATE DOWNWARD PILE CAPACITY PERKINS TO PICARDY CONNECTOR BRIDGE OVER DAWSON CREEK

Picardy to Perkins Connector
Baton Rouge, Louisiana

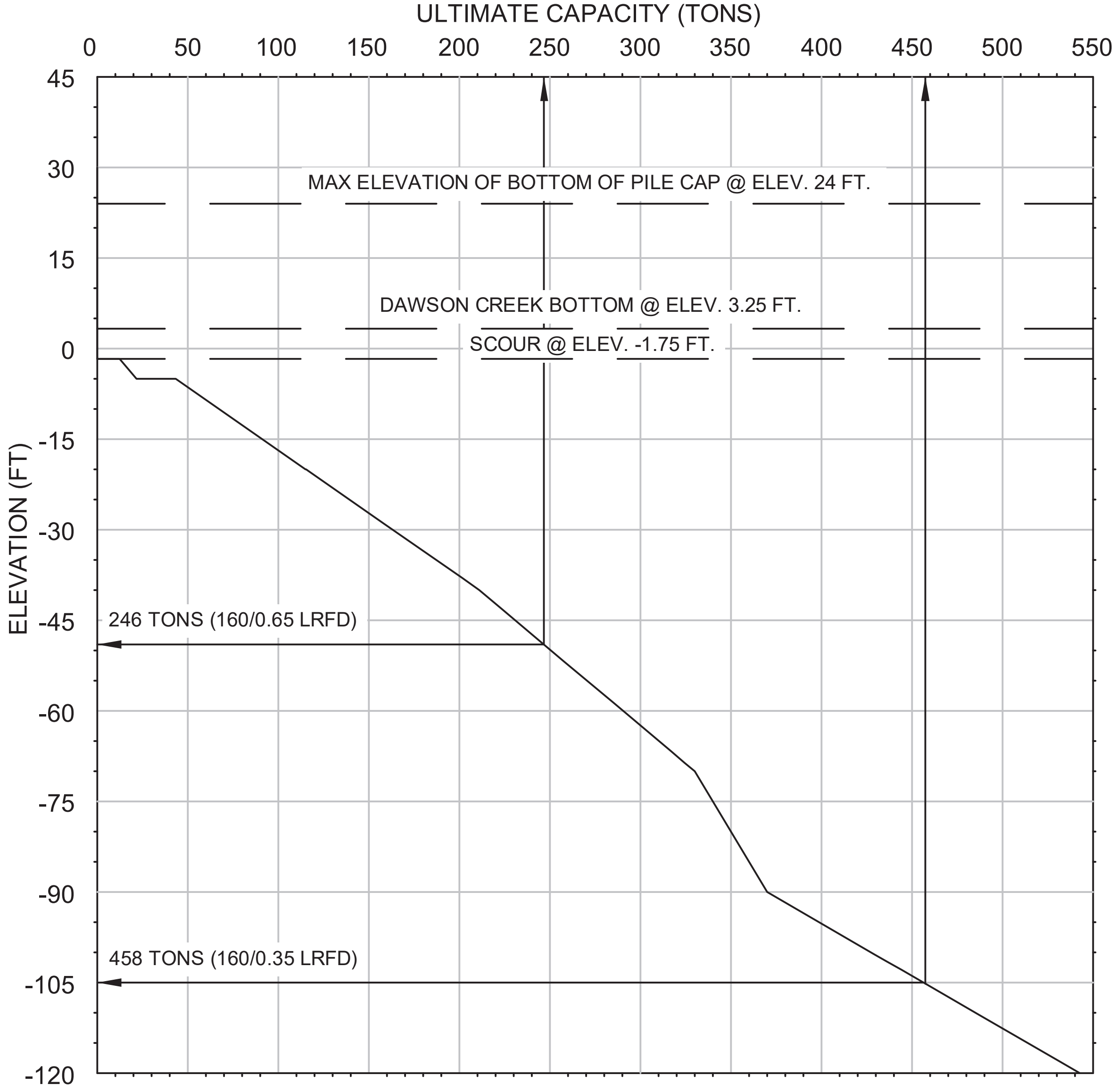
GeoEngineers

Figure 5

IAH : KMC

P:\16\1671005\100\CAD\Capacity.dwg\TAB:Chart A-1 (4) modified on May 20, 2014 - 2:54pm

ATTACHMENT B



LEGEND

——— 24-inch Precast Concrete Pile

ULTIMATE DOWNWARD PILE CAPACITY
BACKCOURT DRIVE BRIDGE OVER DAWSON CREEK

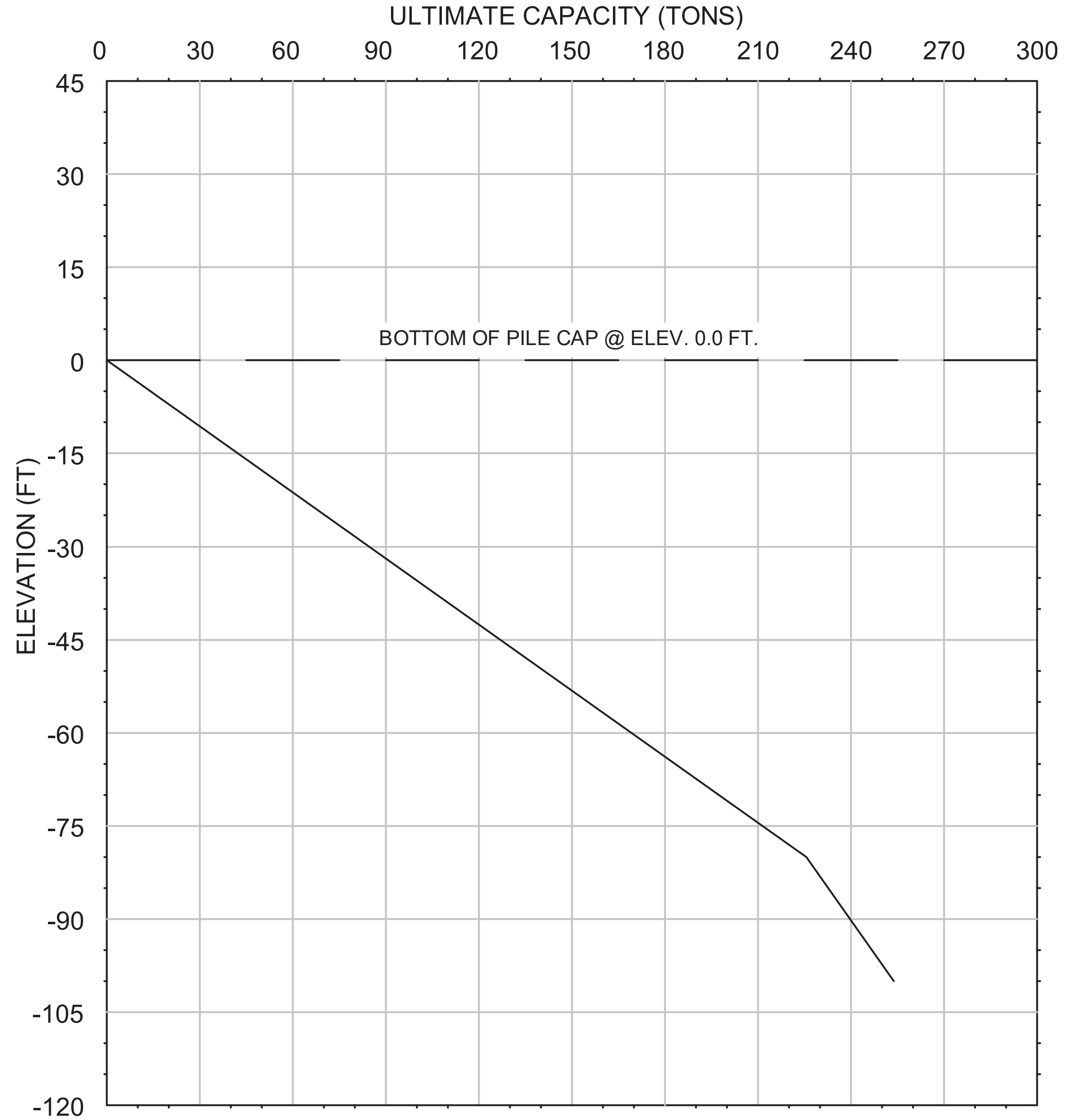
Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 6

IAH : KMC

P:\16\1671005\100\CAD\Capacity.dwg\TAB:Chart A-1 (3) modified on May 20, 2014 - 2:55pm



LEGEND

———	HP 14X73 Steel Pile

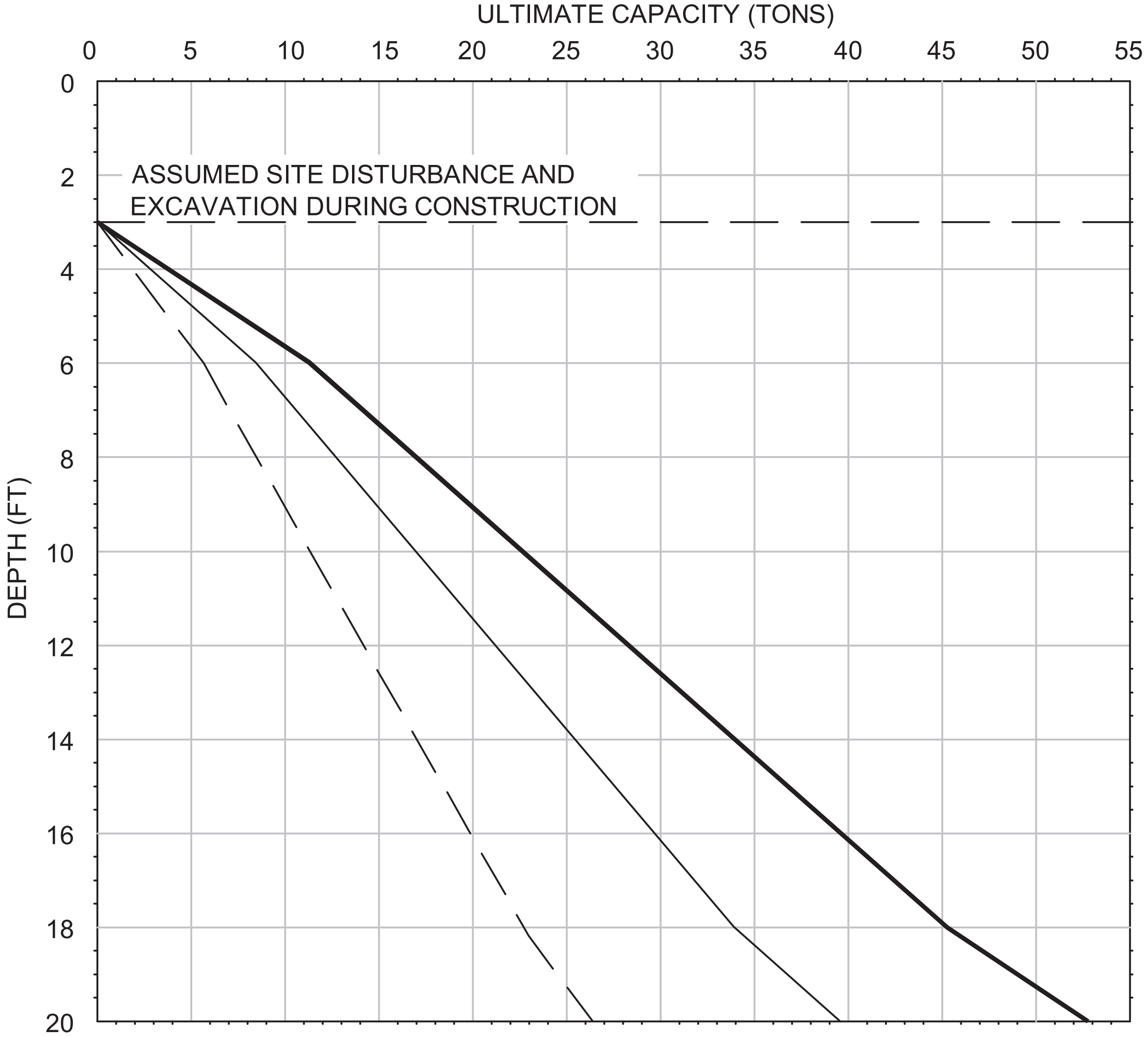
ULTIMATE DOWNWARD PILE CAPACITY
KANSAS CITY SOUTHERN RAILROAD
OVERPASS STRUCTURE

City of BTR - Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 7

IAH : KMC



LEGEND

— — 12-inch Diameter Drilled Shaft
—— 18-inch Diameter Drilled Shaft
▬▬ 24-inch Diameter Drilled Shaft

ALLOWABLE DOWNWARD SHAFT CAPACITY
PRIVACY WALL (PERKINS RD. TO DAWSON CREEK)

Picardy to Perkins Connector
Baton Rouge, Louisiana

GEOENGINEERS

Figure 8

P:\16\16710051\00\CAD\Capacity.dwg\TAB:Chart A-1 (7) modified on May 22, 2014 - 2:03pm

ATTACHMENT B

APPENDIX A

Field Exploration and Laboratory Testing

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

This appendix describes the field exploration and laboratory testing program performed by GeoEngineers to support this project.

Soil and groundwater conditions at the site were explored in two different mobilizations to the site. The first drilling activities took place between September 10th and 20th, 2013. Borings B-1 through B-8 along the proposed connector and privacy wall alignment were drilled. The first mobilization for drilling also made use of easier access to boring locations along the existing Mall of Louisiana and adjacent property development for B-20 through B-27 and B-31 at the Backcourt Drive Bridge. The second mobilization was a combination of ATV-mounted drilling and marsh-buggy mounted drilling, taking place between January 6th and 19th, 2014. The boring locations were B-9 through B-17, B-28 through B-30, B-32, and B-33. The second mobilization borings were at locations along the proposed bridge alignments and railroad.

The depth of the soil samples varied across the site. The borings along the roadway and privacy wall alignment (B-1 through B-10) were drilled to about 20 feet below existing ground surface (bgs). The borings for the bridges over Dawson Creek, B-11 through B-13 and B-31 through B-33, were drilled to about 120 feet bgs. The railroad alignment borings, B-28 through B-30, were also drilled to about 120 feet bgs. At the proposed retaining wall location, B-14 through B-17 were drilled to 60 feet bgs. Near the mall intersection, borings B-20 through B-27 were drilled between 30 feet bgs and 120 feet bgs.

Soil Borings

A field technician from GeoEngineers managed the drilling on a full-time basis; examined and classified the soils encountered, obtained representative samples, observed groundwater conditions and prepared a detailed log of each borehole. The soils encountered were classified visually in general accordance with ASTM International (ASTM) D2488. Logs of the explorations are presented in Log of Borings, Figures A-1 through A-11. The approximate exploration locations are shown on Figures 3A and 3B.

Borehole sampling was conducted in general accordance with applicable ASTM specifications. High-quality, undisturbed, cohesive and semi-cohesive soil (clay/clayey silt) specimens suitable for laboratory strength testing were obtained using a 30-inch-long, 3-inch outside diameter (O.D.), thin-walled steel Shelby tube sampler. The sampler was hydraulically pushed into the ground a distance not exceeding 24 inches per specimen.

Classification samples of granular materials (sand and silt) were extracted using a standard penetration test (SPT) split spoon sampler. This test required driving a 24-inch-long, 2-inch O.D., sample tube into the ground with a 140-pound hammer falling 30 inches. The penetration resistance was recorded as the number of hammer blows required to advance the sampler 12 inches after first seating it for 6 inches. The borings were sampled continuously from the ground surface to a depth of 10 feet at the bridge abutments and roadways, and on 5-foot centers elsewhere to the borehole termination depth.

ATTACHMENT B

Laboratory Testing

General

Soil samples obtained from the borings were transported to the GeoEngineers' laboratory and examined to confirm or modify field classifications, as well as to evaluate engineering properties of the samples. Representative samples were selected for laboratory testing consisting of moisture content determinations, compression strength tests, gradation analysis, consolidation tests, and Atterberg limits tests. Some tests are discussed in more detail below, and the results are presented on the soil boring logs and figures included in this appendix.

Moisture Content Testing

Moisture content tests were completed in general accordance with ASTM D2216 for representative samples obtained from the soil borings.

Strength Testing

Unconfined compression (UC) and unconsolidated, undrained compression (UU) tests were performed on fine-grained soil samples obtained from the borings. The tests were used to evaluate shear strength characteristics and were completed in general accordance with ASTM D2166 and D2850 test methods.

Atterberg Limits Testing

Atterberg limits testing was performed on selected samples in general accordance with ASTM D4318. This test method determines the liquid limit (LL), plastic limit (PL) and plasticity index (PI) of soil particles passing the No. 40 sieve. The results of the tests are used to assist in soil classification as well as engineering design.

Gradation Analyses Testing

Gradation analyses were completed on selected samples in general accordance with ASTM D422. The results of the tests are used to assist in developing grain-size distribution of the soil.

One-Dimensional Consolidation Testing

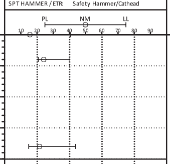
One-dimensional consolidation tests were performed on selected samples in general accordance with ASTM D2435. The results of the tests are used to evaluate consolidation and settlement potential of cohesive soils.

ATTACHMENT B

FIGURE A-1

DRILL RIG AND EQUIPMENT (Boring No. 1)
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Dry Auger
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

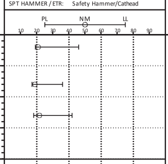
DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	▨	Stiff, tan, Silty CLAY, (CL) with roots	118	16	41	21		1.37	M.S.	1	36.5
	▨	Stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								2	
	▨	Stiff, tan and light gray, Silty CLAY, (CL)	128	24	40	19		1.50	M.S.	3	
	▨	Medium stiff, brown and light gray, Silty CLAY, (CL) with ferrous nodules								4	
10										5	26.5
	▨	Stiff, tan and light gray, CLAY, (CL) with silt and fine sand									
	▨	Very stiff, tan and light gray, CLAY, (CL) with sand pockets								6	
20	▨	Stiff, tan and light gray, CLAY, (CL) with sand and silt	124	22	44	29	72.0	1.71	M.S.	7	16.5
		Bottom of hole at 20 feet Backfilled with grout upon completion.									
30											6.5
40											-3.5
50											-13.5
60											-23.5
70											-33.5
80											-43.5
90											-53.5
100											-63.5
110											-73.5
120											-83.5
130											-93.5
140											-103.5



BORING NO. 1	STA.:	WATER LEVEL:
LATITUDE: 30.37683	OFFSET:	
LONGITUDE: -91.09239	DATE TAKEN: 9/17/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

DRILL RIG AND EQUIPMENT (Boring No. 2)
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Dry 0' - 15' / Wet>15'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

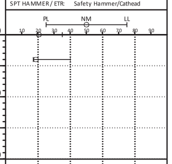
DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	▨	Very stiff, tan and light gray, CLAY, (CL) with silt, brick fragments, and roots (fill)	115	21	46	27		3.18	M.S.	1 2	31.0
	▨	Very stiff, tan and light gray, CLAY, (CL) with silt (fill)								3 4	
10	▨	Very stiff, tan and light gray, Silty CLAY, (CL)	121	19	36	19		1.78	M.S.	5	21.0
	▨	Tan and light gray, Silty CLAY, (CL)									
	▨	Stiff, tan and gray, Silty CLAY, (CL)									
▽	▨	Very stiff, tan and gray, CLAY, (CL) with silt	128	22	42	24		2.68	M.S.	6	
20	▨	Very stiff, tan and gray, CLAY, (CH)								7	11.0
		Bottom of hole at 20 feet Backfilled with grout upon completion.									
30											1.0
40											-9.0
50											-19.0
60											-29.0
70											-39.0
80											-49.0
90											-59.0
100											-69.0
110											-79.0
120											-89.0
130											-99.0
140											-109.0



BORING NO. 2	STA.:	WATER LEVEL: 15' ATD
LATITUDE: 30.37742	OFFSET:	
LONGITUDE: -91.09211	DATE TAKEN: 9/17/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

DRILL RIG AND EQUIPMENT (Boring No. 3)
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	▨	Stiff, tan and light gray, Very Silty CLAY, (CL) with roots	122	21	35	15		1.93	M.S.	1	27.0
	▨	Very stiff, tan and light gray, Very Silty CLAY, (CL)								2	
	▨	Very stiff, tan and light gray, Silty CLAY, (CL)	123	19	40	23		2.31	M.S.	3 4	
10	▨	Very stiff, tan and light gray, CLAY, (CH) with silt and ferrous nodules								5	17.0
	▨	Stiff, tan and light gray, CLAY, (CL) sith silt									
	▨	Stiff, tan and light gray, CLAY, (CH) with ferrous nodules	124	28				1.48	YLD.	6	
20	▨	Very stiff, tan, CLAY, (CH)								7	7.0
		Bottom of hole at 20 feet Backfilled with grout upon completion.									
30											-3.0
40											-13.0
50											-23.0
60											-33.0
70											-43.0
80											-53.0
90											-63.0
100											-73.0
110											-83.0
120											-93.0
130											-103.0
140											-113.0



BORING NO. 3	STA.:	WATER LEVEL:
LATITUDE: 30.37813	OFFSET:	
LONGITUDE: -91.09154	DATE TAKEN: 9/19/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL
▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
08-16-2014

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PARISH	EAST BATON ROUGE	
FEDERAL PROJECT		
PROJECT	12-CS-HC-0044	
DESIGNED:		
CHECKED:		
DETAILED	CMC 10/11/2013	
CHECKED	JMA	
DATE	3/18/2014	
SHEET	1 OF 1	

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

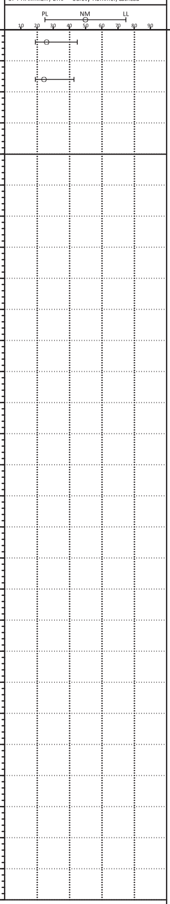
ATTACHMENT B

BORING NO. 4

DRILL RIG AND EQUIPMENT
- DRILL RIG MODEL: Failing 1500
- DRILLING METHOD: Wet Rotary
- HOLE DIAMETER: 4"
- SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Very stiff, gray, CLAY, (CL) with silt								1	23.5
	Very stiff, gray, CLAY, (CL) with silt, wood and 2" silty clay layer	130	26	45	26		3.94	YLD.	2	
	Stiff, dark gray, CLAY, (CL) with ferrous nodules								3	
	Soft, gray, CLAY, (CL) with roots and ferrous nodules								4	
10		125	24	43	24		1.78	YLD.	5	13.5
	Stiff, gray, CLAY, (CL) with silt, roots and ferrous nodules									
	Stiff, light gray, CLAY, (CL)								6	
20	Stiff, light gray, CLAY, (CH)	128	24				1.44	YLD.	7	3.5
	Bottom of hole at 20 feet Backfilled with grout upon completion.									

Depth / Elevation scale: 30 / -6.5; 40 / -16.5; 50 / -26.5; 60 / -36.5; 70 / -46.5; 80 / -56.5; 90 / -66.5; 100 / -76.5; 110 / -86.5; 120 / -96.5; 130 / -106.5; 140 / -116.5



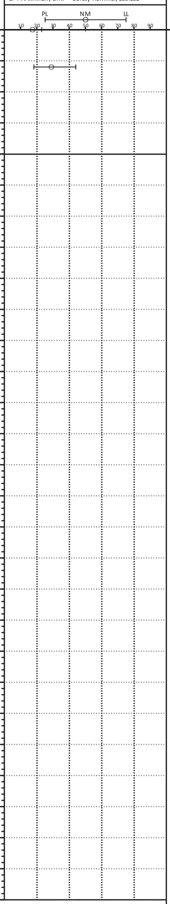
BORING NO. 4	STA.:	WATER LEVEL:
LATITUDE: 30.37883	OFFSET:	
LONGITUDE: -91.09128	DATE TAKEN: 9/19/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 5

DRILL RIG AND EQUIPMENT
- DRILL RIG MODEL: Failing 1500
- DRILLING METHOD: Wet Rotary
- HOLE DIAMETER: 4"
- SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Stiff, gray, CLAY, (CH) with roots	110	17	50	27		1.60	M.S.	1	20.4
	Very stiff, gray and dark gray, CLAY, (CH)								2	
	Stiff, dark gray, CLAY, (CH)								3	
	Medium stiff, gray and light gray, CLAY, (CL) with silt	130	29	44	26		0.76	YLD.	4	
10	Medium stiff, gray, CLAY, (CH)								5	10.4
	Stiff, tan and light gray, CLAY, (CH) with ferrous nodules and calcareous nodules	128	26				1.13	YLD.	6	
20	Medium stiff, tan and light gray, CLAY, (CH)								7	0.4
	Bottom of hole at 20 feet Backfilled with grout upon completion.									

Depth / Elevation scale: 30 / -9.6; 40 / -19.6; 50 / -29.6; 60 / -39.6; 70 / -49.6; 80 / -59.6; 90 / -69.6; 100 / -79.6; 110 / -89.6; 120 / -99.6; 130 / -109.6; 140 / -119.6



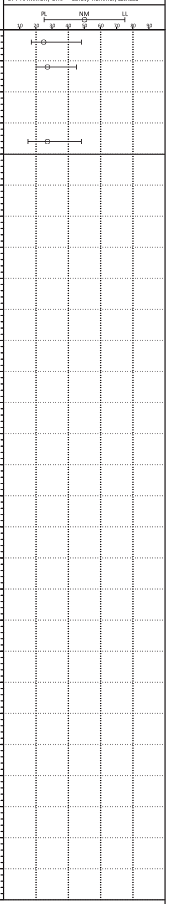
BORING NO. 5	STA.:	WATER LEVEL:
LATITUDE: 30.37933	OFFSET:	
LONGITUDE: -91.09103	DATE TAKEN: 9/19/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 6

DRILL RIG AND EQUIPMENT
- DRILL RIG MODEL: Failing 1500
- DRILLING METHOD: Dry 0' - 8' / Wet >8'
- HOLE DIAMETER: 4"
- SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Stiff, gray, CLAY, (CH)								1	19.7
	Stiff, tan and light gray, CLAY, (CL) with silt and trace organic matter	125	25	48	31		1.21	YLD.	2	
▽	Stiff, tan and light gray, CLAY, (CL) with silt								3	
	Stiff, light gray and gray, CLAY, (CL) with silt	128	27	45	25		1.17	YLD.	4	
10									5	9.7
	Very stiff, gray, CLAY, (CH) with ferrous nodules									
	Very stiff, light gray, CLAY, (CH) with ferrous nodules and clay pockets								6	
20	Stiff, light gray, CLAY, (CL) with silt, ferrous nodules and calcareous pockets	124	27	48	33		1.06	YLD.	7	-0.3
	Bottom of hole at 20 feet Backfilled with grout upon completion.									

Depth / Elevation scale: 30 / -10.3; 40 / -20.3; 50 / -30.3; 60 / -40.3; 70 / -50.3; 80 / -60.3; 90 / -70.3; 100 / -80.3; 110 / -90.3; 120 / -100.3; 130 / -110.3; 140 / -120.3



BORING NO. 6	STA.:	WATER LEVEL: 6' ATD
LATITUDE: 30.37964	OFFSET:	
LONGITUDE: -91.09067	DATE TAKEN: 9/20/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL

▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:
M.S. = Multiple Shear
S/S = Slickensides
V.S. = Vertical Shear
SL. = Slump
YLD. = Yield
60 S. = Shear Angle

SPT TERMINATION, AASHTO T 206
1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗ = SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY = Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT = Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX = Atterberg limits and indices, DOTD TR 428
SPT = Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU = Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C = Soil cohesion (tons per sq. ft.)
ϕ = Soil angle of internal friction (degrees)
△ = Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
\+ = Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
* = Hydrometer test performed

MISCELLANEOUS:

■ C-3 = Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3 = Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3 = Location and Identification of SPT sample, AASHTO T 206
NO RECV. = No Recovery, unable to recover sample for testing or classification.
DIST. = Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS = Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR = = Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
PROFESSIONAL ENGINEER
05-16-2014

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FIGURE	A-2
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
PROJECT	12-CS-HC-0044
DESIGNED:	
CHECKED:	
DETAILED	CMC 10/11/2013
CHECKED	JMA
DATE	3/20/2014
SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

ATTACHMENT B

BORING NO. 7

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										19.6
	Very stiff, dark gray, CLAY, (CL) with silt	125	25	48	28		2.38	M.S.	1	
	Very stiff, gray, CLAY, (CH) with silt lenses								2	
		122	27	46	27		0.83	M.S.	3	
	Medium stiff, gray and light gray, CLAY, (CL) with silt and calcareous pockets								4	
10		128	24				1.32	M.S.	5	9.6
	Medium stiff, gray and light gray, CLAY, (CH)									
	Stiff, light gray, Silty CLAY, (CL) with ferrous nodules and calcareous pockets	126	24				0.60	YLD.	6	
20	Medium stiff, gray and light gray, CLAY, (CH) with calcareous and ferrous nodules								7	-0.4
	Very stiff, light gray, CLAY, (CH) with calcaraeous nodules and ferrous nodules									
	Bottom of hole at 20 feet Backfilled with grout upon completion.									
30										-10.4
40										-20.4
50										-30.4
60										-40.4
70										-50.4
80										-60.4
90										-70.4
100										-80.4
110										-90.4
120										-100.4
130										-110.4
140										-120.4

BORING NO. 7	STA.:	WATER LEVEL:
LATITUDE: 30.38028	OFFSET:	
LONGITUDE: -91.09036	DATE TAKEN: 9/20/2103	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 8

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										20.9
	Very stiff, tan and dark gray, CLAY, (CH) with roots								1	
	Very stiff, tan and dark gray, CLAY, (CH) with roots	117	17	55	38		3.57	M.S.	2	
	Very stiff, tan and dark gray, CLAY, (CH) with wood								3	
		127	28	48	29		1.02	M.S.	4	
10	Stiff, gray and light gray, CLAY, (CH) with ferrous nodules	121	27				0.82	M.S.	5	10.9
	Medium stiff, tan and light gray, CLAY, (CL) with silt, calcareous nodules, and ferrous nodules								6	
20	Medium stiff, light gray and tan, CLAY, (CH) with calcareous and ferrous nodules								7	0.9
	Medium stiff, light gray and tan, CLAY, (CH) with calcareous nodules									
	Bottom of hole at 20 feet Backfilled with grout upon completion.									
30										-9.1
40										-19.1
50										-29.1
60										-39.1
70										-49.1
80										-59.1
90										-69.1
100										-79.1
110										-89.1
120										-99.1
130										-109.1
140										-119.1

BORING NO. 8	STA.:	WATER LEVEL:
LATITUDE: 30.38094	OFFSET:	
LONGITUDE: -91.09028	DATE TAKEN: 9/19/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL
▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S. = Multiple Shear	SL. = Slump
S/S = Slickensides	YLD. = Yield
V.S. = Vertical Shear	60 S. = Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
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05-16-2014

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GeoEngineers

Picardy-Perkins Connector Road

Field Book No.
LOGS OF SOIL BORINGS

NO.	DATE	REVISION DESCRIPTION	BY

DESIGNED:
CHECKED:
DETAILED CMC 10/11/2013
CHECKED JMA
DATE 3/20/2014
SHEET 1 OF 1

PARISH EAST BATON ROUGE
FEDERAL PROJECT
PROJECT 12-CS-HC-0044

FIGURE A-3

3/20/14 10:43

ATTACHMENT B

DRILL RIG AND EQUIPMENT

DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 8' / Wet >8'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	▨	Stiff, tan, CLAY, (CL) with silt								■ 1	19.6
	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and ferrous nodules		25	49	31				■ 2	
	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and calcareous nodules	119	26				0.50@2.01	YLD.	■ 3	
▽	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and trace sand								■ 4	
10	▨		126	30				0.52	YLD.	■ 5	9.6
	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and calcareous nodules									
	▨	Soft, tan and gray, CLAY, (CL) with silt	130	25				0.44@5.63	M.S.	■ 6	
20	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and silt streaks	127	24				0.57	YLD.	■ 7	-0.4
		Bottom of hole at 20 feet Backfilled with grout upon completion.									
30											-10.4
40											-20.4
50											-30.4
60											-40.4
70											-50.4
80											-60.4
90											-70.4
100											-80.4
110											-90.4
120											-100.4
130											-110.4
140											-120.4

PL NM LL
10 20 30 40 50 60 70 80 90

BORING NO. 9	STA.:	WATER LEVEL: 8' ATD
LATITUDE: 30.38294	OFFSET:	
LONGITUDE: -91.09006	DATE TAKEN: 1/10/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

DRILL RIG AND EQUIPMENT

DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 4' / Wet >4'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	▨	Stiff, brown, CLAY, (CH) with organic matter roots								■ 1	19.7
▽	▨	Medium stiff, tan and gray, CLAY, (CH) with ferrous nodules	126	31				0.84	YLD.	■ 2	
	▨		127	28	42	22		0.68@2.01	YLD.	■ 3	
	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and calcareous nodules								■ 4	
10	▨	Stiff, tan and gray, CLAY, (CL)	127	24				1.68	YLD.	■ 5	9.7
	▨	Stiff, tan and gray, CLAY, (CL) with silt, calcareous nodules and ferrous nodules									
	▨	Medium stiff, tan and gray, CLAY, (CH)	127	23				0.83	YLD.	■ 6	
20	▨	Stiff, tan and gray, CLAY, (CH)	132	24				1.39	YLD.	■ 7	-0.3
		Bottom of hole at 20 feet Backfilled with grout upon completion.									
30											-10.3
40											-20.3
50											-30.3
60											-40.3
70											-50.3
80											-60.3
90											-70.3
100											-80.3
110											-90.3
120											-100.3
130											-110.3
140											-120.3

PL NM LL
10 20 30 40 50 60 70 80 90

BORING NO. 10	STA.:	WATER LEVEL: 4' ATD
LATITUDE: 30.38381	OFFSET:	
LONGITUDE: -91.08872	DATE TAKEN: 1/10/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625

05-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

GEOENGINEERS

FIGURE	A-4		
PARISH	EAST BATON ROUGE		
FEDERAL PROJECT			
PROJECT	12-CS-HC-0044		
DESIGNED:			
CHECKED:			
DETAILED	CMC 10/11/2013		
CHECKED	JMA		
DATE	3/20/2014		
SHEET	1 OF 1		
NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

ATTACHMENT B

BORING NO. 11

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Stiff, tan and gray, CLAY, (CH)								▮ 1	19.1
	Stiff, gray, CLAY, (CH)								▮ 2	
	Stiff, tan and light gray, CLAY, (CL) with silt, ferrous nodules and calcareous nodules	127	27	42	20		1.09	M.S.	▮ 3	
									▮ 4	
10	Medium stiff, tan and light gray, CLAY, (CL)	124	23	39	23		1.28	M.S.	▮ 5	9.1
	Stiff, tan and light gray, Silty CLAY, (CL) with ferrous streaks and calcareous nodules Stiff, tan and light gray, CLAY, (CL) with calcareous nodules								▮ 6	
20	Stiff, tan and light gray, CLAY, (CL) with silt and calcareous nodules	129	25	43	24		1.25	YLD.	▮ 7	-0.9
	Medium stiff, tan and light gray, Clayey ELASTIC SILT, (CL-ML) with sand	126	25	27	7	88.0	0.83	M.S.	▮ 8	
30	Stiff, light gray, CLAY, (CH) with fine sand								▮ 9	-10.9
	Very stiff, gray, CLAY, (CL) with sand	130	23			85.0	2.30	YLD.	▮ 10	
40	Very stiff, tan and gray, CLAY, (CH)								▮ 11	-20.9
	Very stiff, tan and gray, CLAY, (CH)	128	28	72	55		1.81 2.01	SLS (60°)	▮ 12	
50	Very stiff, tan and light gray, CLAY, (CH)								▮ 13	-30.9
	Very stiff, tan and light gray, CLAY, (CH)	127	24				2.60	M.S.	▮ 14	
60	Very stiff, tan and light gray, CLAY, (CH)								▮ 15	-40.9
	Very stiff, tan and light gray, CLAY, (CH) with ferrous nodules and calcareous nodules	118	37	70	46		1.26 2.19	SLS (40°)	▮ 16	
70	Very stiff, tan and light gray, CLAY, (CH) Gravel layer								▮ 17	-50.9
	Stiff, tan and light gray, CLAY, (CH) with shell fragments and gravel	126	28				1.28	YLD.	▮ 18	
80	Very stiff, tan and light gray, CLAY, (CH)								▮ 19	-60.9
	Very stiff, tan and light gray, CLAY, (CH)								▮ 20	
90	Stiff, tan, CLAY, (CH)	125	35				1.98	M.S.	▮ 21	-70.9
	Very stiff, tan, CLAY, (CH)								▮ 22	
100	Dense, tan, Silty SAND, (SM) with clay	132	24	22	5	68.0	0.49	M.S.	▮ 23	-80.9
	Very dense, tan and light gray, SAND, (SP) with trace clay						27-49-50 (99)		☒ 24	
110	Very dense, tan and light gray, Silty SAND, (SM)					44.0	19-23-25 (48)		☒ 25	-90.9
	Dense, tan, SAND, (SP) with trace clay						15-17-17 (34)		☒ 26	
120	Dense, tan, SAND, (SP) with clay						18-19-27 (46)		☒ 27	-100.9
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-110.9
140										-120.9

BORING NO. 11	STA.:	WATER LEVEL:
LATITUDE: 30.38106	OFFSET:	
LONGITUDE: -91.08736	DATE TAKEN: 9/17/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 12

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Marsh Buggy Mounted
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Hydraulic Hammer

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	6" water at surface								▮ 1	3.7
	Medium stiff, gray, Sandy CLAY, (CL) Medium stiff, gray, Very Silty CLAY, (CL)	139	24	28	9		0.71	M.S.	▮ 2	
	Stiff, gray, Silty CLAY, (CL)								▮ 3	
	Stiff, gray, Very Silty CLAY, (CL)	133	23	26	14		1.21@2.78	M.S.	▮ 4	
10	Stiff, gray, CLAY, (CL) with silt								▮ 5	-6.3
	Very stiff, gray, Silty CLAY, (CL)	134	21	35	20		2.33	YLD.	▮ 6	
20	Stiff, gray, CLAY, (CL)								▮ 7	-16.3
	Stiff, gray, CLAY, (CH)	121	41	89	61		0.75 1.44 REMOLD	SLS (60°)	▮ 8	
30	Stiff, tan and gray, CLAY, (CH)								▮ 9	-26.3
	Stiff, tan and gray, CLAY, (CH)	125	25	60	42		1.68@13.61	Bulge	▮ 10	
40	Stiff, tan and gray, CLAY, (CH)								▮ 11	-36.3
	Very stiff, tan and gray, CLAY, (CL) with silt	132	20	46	33		2.22	YLD.	▮ 12	
50	Stiff, tan, CLAY, (CL) with silt								▮ 13	-46.3
	Medium stiff, tan, Silty CLAY, (CL)	126	29	41	22		0.52	YLD.	▮ 14	
60	Very stiff, gray, CLAY, (CH) with 2" sandy clay layer								▮ 15	-56.3
	Medium stiff, tan, Clayey ELASTIC SILT, (CL-ML)	124	27	23	5		0.47@25.63	YLD.	▮ 16	
70	Medium stiff, tan, Silty CLAY, (CL)								▮ 17	-66.3
	Medium stiff, tan and gray, CLAY, (CL) with silt	129	24				0.69	M.S.	▮ 18	
80	Very stiff, tan and gray, CLAY, (CL) with silt								▮ 19	-76.3
	Stiff, gray, Silty CLAY, (CL)	129	25	40	26		1.36	YLD.	▮ 20	
90	Stiff, gray, CLAY, (CH) with trace silt								▮ 21	-86.3
	Medium stiff, tan and gray, CLAY, (CH) with shell fragments	121	34				0.98	YLD.	▮ 22	
100	Very stiff, tan and gray, CLAY, (CH)								▮ 23	-96.3
	Hard, tan and gray, CLAY, (CH)								▮ 24	
110	Very stiff, tan and gray, CLAY, (CH)	128	22				2.15	YLD.	▮ 25	-106.3
	Stiff, tan and gray, CLAY, (CL) with silt and silt lenses								▮ 26	
120	Very stiff, tan and gray, CLAY, (CL) with silt	129	24				2.13	YLD.	▮ 27	-116.3
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-126.3
140										-136.3

BORING NO. 12	STA.:	WATER LEVEL:
LATITUDE: 30.38133	OFFSET:	
LONGITUDE: -91.42342	DATE TAKEN: 1/8/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 13

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 6' / Wet >6'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Stiff, brown, CLAY, (CH) with roots								▮ 1	19.8
	Medium stiff, tan and gray, Very Silty CLAY, (CL)	121	23				0.55	M.S.	▮ 2	
	Medium stiff, light gray, CLAY, (CL) with silt and ferrous nodules	134	28	44	25		0.91	YLD.	▮ 3	
	Medium stiff, light gray, Silty CLAY, (CL) with ferrous nodules	126	28				0.84	YLD.	▮ 4	
10	Medium stiff, tan and gray, CLAY, (CL) with silt	126	27				0.84	YLD.	▮ 5	9.8
	Stiff, tan and gray, CLAY, (CL) with silt	135	25				1.62	YLD.	▮ 6	
20	Stiff, tan and gray, CLAY, (CH) with calcareous nodules	123	24				1.53	YLD.	▮ 7	-0.2
	Medium stiff, gray, Clayey ELASTIC SILT, (CL-ML)	134	36	21	6		2.55@9.58	YLD.	▮ 8	
30	Stiff, tan and gray, CLAY, (CL) with silt and silt streaks								▮ 9	-10.2
	Stiff, tan and gray, CLAY, (CL) with silt	131	25				1.33	YLD.	▮ 10	
40	Stiff, tan and gray, CLAY, (CH)								▮ 11	-20.2
	Stiff, tan and gray, CLAY, (CH)	131	34				1.62 1.61 REMOLD	SLS (60°)	▮ 12	
50	Very stiff, tan and gray, CLAY, (CH)								▮ 13	-30.2
	Very stiff, tan and gray, CLAY, (CH) with ferrous nodules	125	24				2.67	Bulge	▮ 14	
60	Very stiff, tan and gray, CLAY, (CH)								▮ 15	-40.2
	Stiff, tan and gray, CLAY, (CH)	126	36				1.18 1.57 REMOLD	SLS (60°)	▮ 16	
70	Very stiff, tan and gray, CLAY, (CH)								▮ 17	-50.2
	Stiff, tan and gray, CLAY, (CH)	124	35				0.76 1.77 REMOLD	SLS (45°)	▮ 18	
80	Very stiff, tan and gray, CLAY, (CH)								▮ 19	-60.2
	Very stiff, tan and gray, CLAY, (CH)	126	24				2.77	M.S.	▮ 20	
90	Very stiff, tan and gray, CLAY, (CH)								▮ 21	-70.2
	Very stiff, tan and gray, CLAY, (CH)								▮ 22	
100	Soft, tan and gray, Very Silty CLAY, (CL) with sand	124	24				0.18@39.58	YLD.	▮ 23	-80.2
	Medium dense, tan and gray, Clayey SAND, (SC)	125	22				1.87@41.60	YLD.	▮ 24	
110	Medium dense, tan, Clayey SAND, (SC)								▮ 25	-90.2
	Stiff, tan and gray, CLAY, (CL)	125	36				1.93	SLS (60°)	▮ 26	
120	Very stiff, tan and gray, CLAY, (CL)								▮ 27	-100.2
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-110.2
140										-120.2

BORING NO. 13	STA.:	WATER LEVEL: 6' ATD
LATITUDE: 30.38203	OFFSET:	
LONGITUDE: -91.09017	DATE TAKEN: 1/17/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CH
▨ CL
▨ CL-ML
▨ SM
▨ SP

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
Δ	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

▮ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
▮ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
05-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

GEOENGINEERS

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

FIGURE	A-5		
PARISH	EAST BATON ROUGE		
FEDERAL PROJECT			
PROJECT	12-CS-HC-0044		
DESIGNED:		CHECKED:	
DETAILED	CMC 10/11/2013	CHECKED	JMA
DATE	3/20/2014	SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

ATTACHMENT B

BORING NO. 14

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0		Stiff, brown, CLAY, (CH) with roots								■ 1	19.1
		Stiff, gray, CLAY, (CH)	121	24	52	36		1.15	YLD.	■ 2	
10		Soft, tan and gray, CLAY, (CL) with silt and silt streaks	132	29	43	26		0.26@3.61	YLD.	■ 3	9.1
		Stiff, tan and gray, CLAY, (CH) with silt pockets and ferrous nodules	128	25				1.64	YLD.	■ 4	
20		Stiff, tan and gray, CLAY, (CH) with silt streaks								■ 5	-0.9
		Very stiff, gray, Very Silty CLAY, (CL) with silt streaks	131	20	32	19		2.61	M.S.	■ 6	
30		Stiff, gray, CLAY, (CL) with silt and silt pockets								■ 7	-10.9
		Stiff, tan and gray, CLAY, (CH)	119	36				1.98	M.S.	■ 8	
40		Very stiff, tan and gray, CLAY, (CH)								■ 9	-20.9
		Very stiff, tan and gray, CLAY, (CH)	124	31	64	49		2.74	M.S.	■ 10	
50		Very stiff, tan and gray, CLAY, (CH)								■ 11	-30.9
		Stiff, tan and gray, CLAY, (CH) with calcareous nodules	120	25				1.55	SLS (50°)	■ 12	
60		Very stiff, tan and gray, CLAY, (CH) with calcareous nodules	116	30	80	56		2.28	M.S.	■ 13	-40.9
		Bottom of hole at 60 feet Backfilled with grout upon completion.									
70											-50.9
80											-60.9
90											-70.9
100											-80.9
110											-90.9
120											-100.9
130											-110.9
140											-120.9

PL — NM — LL: 10 20 30 40 50 60 70 80 90

BORING NO. 14	STA.:	WATER LEVEL:
LATITUDE: 30.38481	OFFSET:	
LONGITUDE: -91.08814	DATE TAKEN: 1/11/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 15

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 10' / Wet >10'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0		Medium stiff, brown, CLAY, (CL) with silt and roots	119	37	47	28		0.91	YLD.	■ 1	18.3
		Stiff, tan and gray, CLAY, (CL) with silt and ferrous nodules	125	26				1.07	YLD.	■ 2	
10		Medium stiff, tan and gray, CLAY, (CL) with silt and silt streaks and ferrous nodules	127	26				0.98@3.61	Bulge	■ 3	8.3
		Stiff, tan and gray, CLAY, (CH) with silt streaks	120	25				1.26	M.S.	■ 4	
20		Stiff, tan and gray, CLAY, (CL) with silt and fererous nodules	129	24	45	29		1.22	YLD.	■ 5	-1.7
		Stiff, tan and gray, CLAY, (CL) with trace silt								■ 6	
30		Stiff, tan and gray, Very Silty CLAY, (CL)	130	23	30	17		1.16	YLD.	■ 7	-11.7
		Stiff, tan and gray, CLAY, (CH)								■ 8	
40		Stiff, tan and gray, CLAY, (CH) with silt streaks	123	28				1.27	M.S.	■ 9	-21.7
		Very stiff, tan and gray, CLAY, (CH)								■ 10	
50		Stiff, tan and gray, CLAY, (CH)	119	35				1.50	M.S.	■ 11	-31.7
		Very stiff, tan and gray, CLAY, (CH)								■ 12	
60		Very stiff, tan and gray, CLAY, (CH)	123	24				2.28	YLD.	■ 13	-41.7
		Bottom of hole at 60 feet Backfilled with grout upon completion.									
70											-51.7
80											-61.7
90											-71.7
100											-81.7
110											-91.7
120											-101.7
130											-111.7
140											-121.7

PL — NM — LL: 10 20 30 40 50 60 70 80 90

BORING NO. 15	STA.:	WATER LEVEL: 10' ATD
LATITUDE: 30.38464	OFFSET:	
LONGITUDE: -91.08783	DATE TAKEN: 1/11/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 16

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 20' / Wet >20'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0		Stiff, brown, CLAY, (CH) with roots								■ 1	19.9
		Stiff, tan and gray, (CH)		21	50	33				■ 2	
10		Medium stiff, tan and gray, Silty CLAY, (CL) with ferrous nodules	122	24	40	23		0.98@3.61	Bulge	■ 3	9.9
		Stiff, tan and gray, CLAY, (CH)	127	25				1.26	M.S.	■ 4	
20		Very stiff, tan and gray, CLAY, (CH)	129	21	58	40		2.50	YLD.	■ 5	-0.1
		Very stiff, tan and gray, CLAY, (CH)								■ 6	
30		Stiff, tan and gray, CLAY, (CH)	124	31	55	35		1.68	M.S.	■ 7	-10.1
		Very stiff, tan and gray, CLAY, (CH)								■ 8	
40		Stiff, tan and gray, CLAY, (CH)	122	34				1.46 1.41 REMOLD	SLS (45°)	■ 9	-20.1
		Very stiff, tan and gray, CLAY, (CH)								■ 10	
50		Very stiff, tan and gray, CLAY, (CH)	122	28	69	46		2.25	M.S.	■ 11	-30.1
		Very stiff, tan and gray, CLAY, (CH)								■ 12	
60		Stiff, tan and gray, CLAY, (CH)	127	27				2.05	M.S.	■ 13	-40.1
		Bottom of hole at 60 feet Backfilled with grout upon completion.									
70											-50.1
80											-60.1
90											-70.1
100											-80.1
110											-90.1
120											-100.1
130											-110.1
140											-120.1

PL — NM — LL: 10 20 30 40 50 60 70 80 90

BORING NO. 16	STA.:	WATER LEVEL:
LATITUDE: 30.38508	OFFSET:	
LONGITUDE: -91.08789	DATE TAKEN: 1/12/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CH
▨ CL

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:
M.S. = Multiple Shear
S/S = Slickensides
V.S. = Vertical Shear
SL. = Slump
YLD. = Yield
60 S. = Shear Angle

SPT TERMINATION, AASHTO T 206
1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
05-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-6
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
PROJECT	12-CS-HC-0044
DESIGNED:	
CHECKED:	
DETAILED	CMC 10/11/2013
CHECKED	JMA
DATE	3/20/2014
SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

3/20/14 10:44

BORING NO. 17

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 20' / Wet >20'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										18.7
	Stiff, brown, CLAY, (CH) with roots								1	
	Soft, gray, CLAY, (CH) with silt streaks	121	25	57	39		0.43@1.60	Bulge	2	
10	Soft, gray, CLAY, (CL) with silt and silt pockets	126	26				0.37@3.61	YLD.	3	8.7
	Medium stiff, gray, CLAY, (CH) with silt streaks	124	27	58	40		0.97@5.63	Bulge	4	
20	Soft, gray, CLAY, (CL) with silt and silt streaks	125	26				0.33@7.57	M.S.	5	-1.3
	Medium stiff, gray, CLAY, (CL) with silt	128	23	41	24		0.91@9.58	YLD.	6	
30	Stiff, tan and gray, CLAY, (CL) with silt	120	25				1.94	M.S.	7	-11.3
	Very stiff, tan and gray, CLAY, (CH) with 2" sandy clay layer								8	
40	Stiff, tan and gray, CLAY, (CH)	117	40				1.30 1.30 REMOLD	SLS (50°)	9	-21.3
	Very stiff, tan and gray, CLAY, (CH)								10	
50	Very stiff, tan and gray, CLAY, (CL)	120	34				2.11	SLS (60°)	11	-31.3
	Very stiff, tan and gray, CLAY, (CH)								12	
60	Very stiff, tan and gray, CLAY, (CH)	126	28				2.26	SLS (60°)	13	-41.3
	Bottom of hole at 60 feet Backfilled with grout upon completion.									
70										-51.3
80										-61.3
90										-71.3
100										-81.3
110										-91.3
120										-101.3
130										-111.3
140										-121.3

BORING NO. 17	STA.:	WATER LEVEL:
LATITUDE: 30.38489	OFFSET:	
LONGITUDE: -91.08781	DATE TAKEN: 1/12/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 20

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Dry 0' - 15' / Wet >15'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										31.9
	Stiff, brown and gray, CLAY, (CL) with organic matter, (fill)								1	
	Stiff, brown and gray, Silty CLAY, (CL) (fill)	127	22	32	15		1.55	M.S.	2	
									3	
10	Stiff, brown and gray, CLAY, (CH) with gravel & 2" sand gravel layer, (fill)	126	21	36	19		1.12	M.S.	4	21.9
	Stiff, brown and gray, Silty CLAY, (CL) (fill) Medium stiff, brown and gray, Silty CLAY, (CL) with ferrous nodules								5	
20	Stiff, tan and light gray, CLAY, (CH)								6	11.9
	Stiff, tan and light gray, CLAY, (CH)	124	40	103	74		1.28	SLS (45°)	7	
30	Stiff, tan and light gray, CLAY, (CH)								8	1.9
	Stiff, tan and light gray, CLAY, (CH)	123	34	81	55		0.88 1.72 REMOLD	SLS (45°)	9	
40	Very stiff, tan and light gray, CLAY, (CH)								10	-8.1
	Very stiff, tan and light gray, CLAY, (CH)	128	24				2.81	V.S.	11	
50	Very stiff, tan and light gray, CLAY, (CH)								12	-18.1
	Very stiff, tan and light gray, CLAY, (CH)	128	26				2.48	M.S.	13	
60	Stiff, tan and light gray, CLAY, (CH)								14	-28.1
	Stiff, tan and light gray, CLAY, (CH)								15	
70	Stiff, tan and light gray, Silty CLAY, (CL)	125	22	36	19		1.23	YLD.	16	-38.1
	Stiff, light gray, CLAY, (CL) with silt								17	
80	Stiff, light gray, CLAY, (CL) with silt								18	-48.1
	Stiff, tan and light gray, CLAY, (CL) with silt								19	
90	Stiff, tan and light gray, CLAY, (CL) with sand	123	27				1.33	YLD.	20	-58.1
	Very stiff, tan and light gray, CLAY, (CL) with silt, sand streaks, and sand pockets	126	30				2.33	V.S.	21	
100	Medium stiff, tan and light gray, CLAY, (CL-ML) with 2" very silty clay layer								22	-68.1
	Medium stiff, tan and light gray, Silty CLAY, (CL) with sand pockets, sand streaks, and 1" clayey sand layer	126	28				0.78	M.S.	23	
110	Very dense, gray, Silty SAND, (SC-SM) with silt			26	4	65.0	27-30-42 (72)		24	-78.1
	Very dense, gray, Clayey SAND, (SC)								25	
120	Very dense, gray, Clayey SAND, (SC)					34.0	16-29-31 (60)		26	-88.1
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-98.1
140										-108.1

BORING NO. 20	STA.:	WATER LEVEL:
LATITUDE: 30.38600	OFFSET:	
LONGITUDE: -91.08736	DATE TAKEN: 9/12/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 21

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Dry 0' - 10' / Wet >10'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										30.0
	Very stiff, tan and gray, CLAY, (CL) with silt, gravel, asphalt, & roots, (fill)								1	
	Very stiff, tan and light gray, Silty CLAY, (CL) with silt lenses, (fill)	131	14	40	22		2.72	M.S.	2	
									3	
	Very stiff, tan and light gray, Silty CLAY, (CL) with silt	123	21	44	24		1.29	M.S.	4	
10	Stiff, tan and gray, CLAY, (CL) silt Stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								5	20.0
	Stiff, tan and gray, CLAY, (CH)	126	24				1.89	YLD.	6	
20	Stiff, tan and gray, CLAY, (CH)								7	10.0
	Stiff, tan and gray, CLAY, (CH)								8	
30	Stiff, tan and gray, CLAY, (CH)	119	35	72	47		1.54	M.S.	9	0.0
	Stiff, tan and gray, CLAY, (CH)								10	
40	Stiff, tan and gray, CLAY, (CH)						1.01 1.40 REMOLD	SLS (50°)	11	-10.0
	Stiff, tan and gray, CLAY, (CH) with sand streaks								12	
50	Stiff, tan and gray, CLAY, (CH)	124	29				1.76	YLD.	13	-20.0
	Stiff, tan and light gray, CLAY, (CH) with ferrous nodules								14	
60	Stiff, tan and light gray, CLAY, (CH)								15	-30.0
	Stiff, tan and gray, CLAY, (CH)	120	29	86	59		1.71	M.S.	16	
70	Very stiff, tan and gray, CLAY, (CH)								17	-40.0
	Very stiff, tan and gray, CLAY, (CH)	119	25				2.66	M.S.	18	
80	Very stiff, tan and gray, CLAY, (CH)								19	-50.0
	Very stiff, tan and light gray, CLAY, (CL) with silt	123	22	44	26		2.01	YLD.	20	
90	Very stiff, tan and light gray, CLAY, (CH)								21	-60.0
	Medium stiff, tan and light gray, Sandy CLAY, (CL) with 6" sand layer	118	23	30	14	71.0	0.71	M.S.	22	
100	Dense, tan, Clayey SAND, (SP)						20-18-15 (33)		23	-70.0
	Very stiff, light gray, Clayey ELASTIC SILT, (CL-ML) with sand					91.0	23-18-21 (39)		24	
110	Dense, light gray, SAND, (SP)						24-24-22 (46)		25	-80.0
	Very dense, light gray, Clayey SAND, (SC-SM) with silt						27-25-27 (52)		26	
120	Very dense, light gray, SAND, (SP)						25-25-26 (51)		27	-90.0
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-100.0
140										-110.0

BORING NO. 21	STA.:	WATER LEVEL:
LATITUDE: 30.38583	OFFSET:	
LONGITUDE: -91.08706	DATE TAKEN: 9/10/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CH ▨ CL

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:
M.S. = Multiple Shear SL. = Slump
S/S = Slickensides YLD. = Yield
V.S. = Vertical Shear 60 S. = Shear Angle

SPT TERMINATION, AASHTO T 206
1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗ = SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY = Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT = Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX = Atterberg limits and indices, DOTD TR 428
SPT = Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU = Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C = Soil cohesion (tons per sq. ft.)
ϕ = Soil angle of internal friction (degrees)
△ = Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
\+ = Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
* = Hydrometer test performed

MISCELLANEOUS:

■ C-3 = Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3 = Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3 = Location and Identification of SPT sample, AASHTO T 206
NO RECV. = No Recovery, unable to recover sample for testing or classification.
DIST. = Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS = Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR = = Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
08-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-7
PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
PROJECT	12-CS-HC-0044
DESIGNED:	
CHECKED:	
DETAILED	CMC 10/11/2013
CHECKED	JMA
DATE	3/20/2014
SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

Report Form: LADOTD - ENGLISH Project File: P:\16\16710051\00\GINT\CITY PARISH - PICARDY-PERKINS - HIGHLAND-BURBANK BORING LOGS.GPJ

ATTACHMENT B

BORING NO. 22

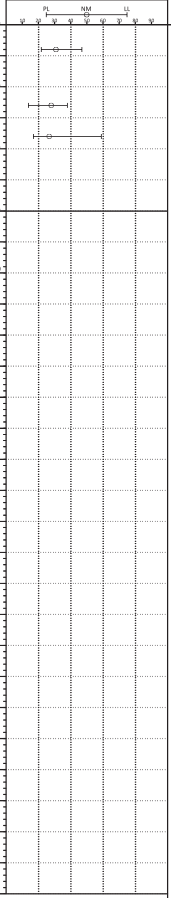
DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER
0–16	Medium stiff, gray, Silty CLAY, (CL) with organic matter								1
	Medium stiff, tan and gray, CLAY, (CL) with silt and roots	127	31	47	25		0.86	YLD.	2
	Medium stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								3 4
	Stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								
	Very stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules	128	28	38	24		2.17	YLD.	5
16–30	Stiff, tan and light gray, CLAY, (CH) with silt streaks	130	27	59	42		1.31	M.S.	6
	Stiff, tan and light gray, CLAY, (CH) with silt streaks								7
	Stiff, tan and light gray, CLAY, (CH)								8

Bottom of hole at 30 feet
Backfilled with grout upon completion.

DEPTH	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
ELEVATION	31.1	21.1	11.1	1.1	-8.9	-18.9	-28.9	-38.9	-48.9	-58.9	-68.9	-78.9	-88.9	-98.9	-108.9

DRILL RIG AND EQUIPMENT

DRILL RIG MODEL:	Failing 1500
DRILLING METHOD:	Wet Rotary
HOLE DIAMETER:	4"
SPT HAMMER / ETR:	Safety Hammer/Cathead



BORING NO. 22	STA.:	WATER LEVEL:
LATITUDE: 30.38608	OFFSET:	
LONGITUDE: -91.08739	DATE TAKEN: 9/13/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 23

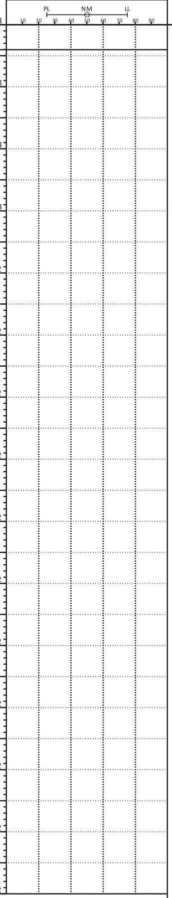
DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER
0–3	Medium stiff, tan, CLAY, with ½" fill layer at bottom								1
3–4	Dense, tan, Clayey SAND								2

Hand-probed multiple locations in 15' radius around B-23. Fill soil encountered in all probes. Hole abandoned due to utilities conflicts
Bottom of hole at 4 feet
Backfilled with grout upon completion.

DEPTH	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
ELEVATION	30.8	20.8	10.8	0.8	-9.2	-19.2	-29.2	-39.2	-49.2	-59.2	-69.2	-79.2	-89.2	-99.2	-109.2

DRILL RIG AND EQUIPMENT

DRILL RIG MODEL:	Failing 1500
DRILLING METHOD:	Dry Auger
HOLE DIAMETER:	4"
SPT HAMMER / ETR:	Safety Hammer/Cathead



BORING NO. 23	STA.:	WATER LEVEL:
LATITUDE:	OFFSET:	
LONGITUDE:	DATE TAKEN: 9/16/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 24

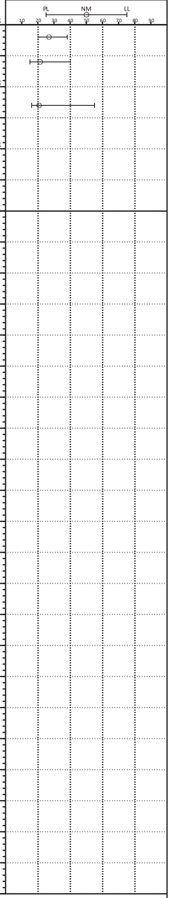
DEPTH (Feet)	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER
0–1	10" concrete								
1–18	Medium stiff, tan and gray, Silty CLAY, (CL) with gravel	128	27	38	18		0.85	M.S.	1 2
	Medium stiff, tan and gray, Silty CLAY, (CL)								3
	Medium stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules	133	21	40	25		2.33	YLD.	4 5
	Very stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								
	Very stiff, tan and light gray, CLAY, (CL) with silt streaks and ferrous nodules	134	21	55	39		3.25	YLD.	6
	Very stiff, tan and light gray, CLAY, (CH)								7
	Stiff, tan and light gray, Silty CLAY, (CL) with sand pockets and claystone nodules								
	Medium stiff, tan and gray, Sandy CLAY, (CL)								8
28–30	Stiff, tan and gray, CLAY, (CH) with calcareous nodules								9

Bottom of hole at 30 feet
Backfilled with grout upon completion.

DEPTH	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
ELEVATION	29.8	19.8	9.8	-0.2	-10.2	-20.2	-30.2	-40.2	-50.2	-60.2	-70.2	-80.2	-90.2	-100.2	-110.2

DRILL RIG AND EQUIPMENT

DRILL RIG MODEL:	Failing 1500
DRILLING METHOD:	Dry 0' - 15' / Wet >15'
HOLE DIAMETER:	4"
SPT HAMMER / ETR:	Safety Hammer/Cathead



BORING NO. 24	STA.:	WATER LEVEL:
LATITUDE: 30.38639	OFFSET:	
LONGITUDE: -91.08650	DATE TAKEN: 9/11/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL
▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL		DESIGNATION	"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
05-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-8	
PARISH	EAST BATON ROUGE	
FEDERAL PROJECT		
PROJECT	12-CS-HC-0044	
DESIGNED:		
CHECKED:		
DETAILED	CMC	10/11/2013
CHECKED	JMA	
DATE	3/20/2014	
SHEET	1 OF 1	

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GEOENGINEERS

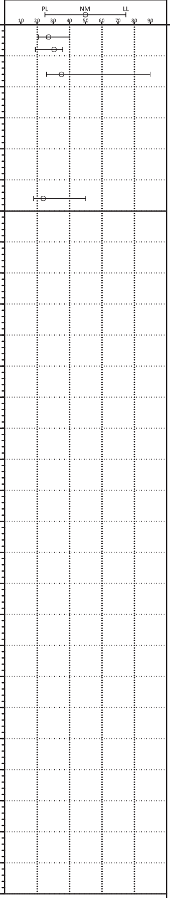
ATTACHMENT B

DRILL RIG AND EQUIPMENT (Borings 25, 26 and 27)

DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Dry Auger
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

BORING NO. 25

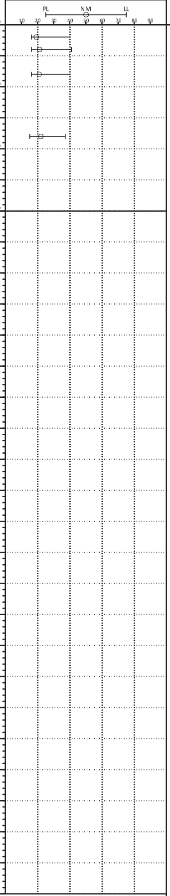
DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										30.9
	Stiff, brown and gray, Silty CLAY, (CL) with gravel, roots, and other organic matter								1	
		120	27	40	19		1.04@0.17	M.S.	2	
	Stiff, tan and light gray, Silty CLAY, (CL)	128	31	36	17		0.60	YLD.	3	
	Medium stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules								4	
10		121	35	90	64		1.23	M.S.	5	20.9
	Stiff, tan and light gray, CLAY, (CH)									
	Stiff, tan and light gray, CLAY, (CH) with sand streaks									
	Very stiff, tan and light gray, CLAY, (CH)								6	
20	Very stiff, tan and light gray, CLAY, (CH)								7	10.9
	Very stiff, tan and light gray, CLAY, (CH) with sand streaks								8	
30	Very stiff, tan and light gray, CLAY, (CH) with trace sand	124	24	50	32	95.2	2.06	M.S.	9	0.9
	Bottom of hole at 30 feet Backfilled with grout upon completion.									
40										-9.1
50										-19.1
60										-29.1
70										-39.1
80										-49.1
90										-59.1
100										-69.1
110										-79.1
120										-89.1
130										-99.1
140										-109.1



BORING NO. 25	STA.:	WATER LEVEL:
LATITUDE: 30.38619	OFFSET:	
LONGITUDE: -91.08653	DATE TAKEN: 9/16/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 26

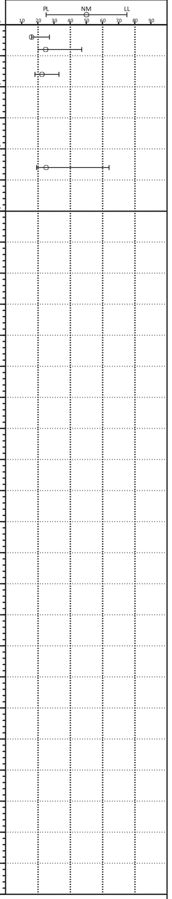
DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										31.5
	Tan and gray, Silty CLAY, (CL) with gravel, (fill)								1	
	Brown and gray, Silty CLAY, (CL) with gravel, (fill)		19	40	24				2	
	Very stiff, brown and gray, Silty CLAY, (CL) with ferrous nodules, (fill)	130	21	41	25		2.10	YLD.	3	
									4	
10	Stiff, brown and light gray, Silty CLAY, (CL) with ferrous nodules and shell fragments, (fill)	131	21	40	24	91.1	2.14	YLD.	5	21.5
	Very stiff, brown and gray, Silty CLAY, (CL) with gravel and ferrous nodules, (fill)								6	
20	Stiff, brown and gray, CLAY, (CH) with gravel, ferrous nodules and organic matter, (fill)	129	22	37	22		1.52	YLD.	7	11.5
	Stiff, brown and gray, Silty CLAY, (CL) with gravel, asphalt, and trace organic matter, (fill)								8	
30	Stiff, brown and gray, CLAY, (CH) with gravel, shells, asphalt, and organic matter, (fill)								9	1.5
	Stiff, brown and gray, Silty CLAY, (CH) with gravel and silt pockets, (fill)									
	Bottom of hole at 30 feet Backfilled with grout upon completion.									
40										-8.5
50										-18.5
60										-28.5
70										-38.5
80										-48.5
90										-58.5
100										-68.5
110										-78.5
120										-88.5
130										-98.5
140										-108.5



BORING NO. 26	STA.:	WATER LEVEL:
LATITUDE: 30.38606	OFFSET:	
LONGITUDE: -91.08786	DATE TAKEN: 9/13/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 27

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	10" roadway concrete									29.5
	Brown and tan, soil-cement base								1	
	Stiff, brown and gray, CLAY, (CL) with large sand pocket and gravel (fill)	131	16	27	11		1.25	M.S.	2	
		123	25	47	27		1.47	M.S.	3	
	Stiff, tan and gray, CLAY, (CL) with silt and ferrous nodules								4	
10	Stiff, tan and gray, Very Silty CLAY, (CL) with ferrous nodules	129	22	33	15		1.21	M.S.	5	19.5
	Stiff, tan and gray, Very Silty CLAY, (CL) with ferrous nodules									
	Medium stiff, tan and gray, Very Silty CLAY, (CL) with ferrous nodules								6	
20	Medium stiff, tan and gray, Very Silty CLAY, (CL) with ferrous nodules								7	9.5
	Very stiff, tan and gray, CLAY, (CH) with ferrous nodules	125	25	64	45		2.24	M.S.	8	
30	Very stiff, tan and gray, CLAY, (CH) with ferrous nodules								9	-0.5
	Bottom of hole at 30 feet Backfilled with grout upon completion.									
40										-10.5
50										-20.5
60										-30.5
70										-40.5
80										-50.5
90										-60.5
100										-70.5
110										-80.5
120										-90.5
130										-100.5
140										-110.5



BORING NO. 27	STA.:	WATER LEVEL:
LATITUDE: 30.38622	OFFSET:	
LONGITUDE: -91.08761	DATE TAKEN: 9/11/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL
▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
∆	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
05-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-9			
PARISH	EAST BATON ROUGE	DESIGNED:		
FEDERAL PROJECT		CHECKED:		
STATE PROJECT	12-CS-HC-0044	DETAILED	CMC 10/11/2013	
		CHECKED	JMA	
		DATE	4/11/2014	
		SHEET	1 OF 1	

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

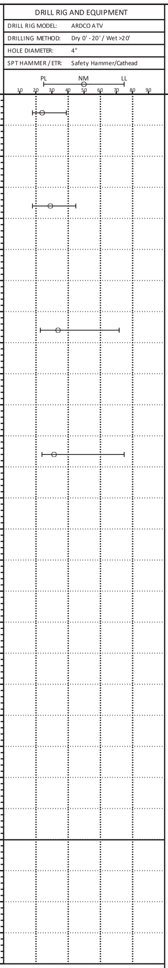
GEOENGINEERS

ATTACHMENT B

DRILL RIG AND EQUIPMENT	
DRILL RIG MODEL:	ARDCO ATV
DRILLING METHOD:	Dry 0' - 20' / Wet >20'
HOLE DIAMETER:	4"
SPT HAMMER / ETR:	Safety Hammer/Cathead

BORING NO. 28

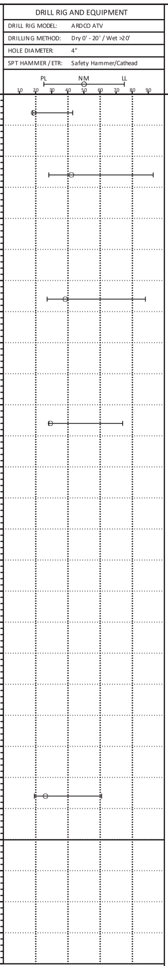
DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0											22.0
	▨	Stiff, tan, (CL) with silt	124	23				1.91	M.S.	1	
	▨	Medium stiff, tan and gray, Silty CLAY, (CL) with silt streaks and ferrous nodules	127	24	39	21		0.96@1.60	Bulge	2	
10	▨	Soft, tan, CLAY, (CL) with silt pockets	125	22				0.39@3.61	YLD.	3	12.0
	▨	Stiff, tan, (CH) with silt streaks	120	33				1.57	M.S.	4	
20	▨	Soft, tan and gray, CLAY, (CL) with silt	124	29	45	27		0.42@7.57	Bulge	5	2.0
	▨	Stiff, tan, CLAY, (CL) with silt	127	29				1.23@9.58	M.S.	6	
30	▨	Stiff, tan and gray, CLAY, (CH)	123	32				1.46 2.03 REMOLD	SLS (60°)	7	-8.0
	▨	Very stiff, tan and gray, CLAY, (CH)	116	38				2.15	SLS (45°)	8	
40	▨	Stiff, tan and gray, CLAY, (CH)	120	34	72	49		1.29 1.15 REMOLD	SLS (50°)	9	-18.0
	▨	Stiff, tan and gray, CLAY, (CH)								10	
50	▨	Stiff, tan and gray, CLAY, (CL) with silt	118	31				1.34	M.S.	11	-28.0
	▨	Very stiff, tan and gray, CLAY, (CH)								12	
60	▨	Very stiff, tan and gray, CLAY, (CH)	123	32	75	51		2.49	M.S.	13	-38.0
	▨	Very stiff, tan and gray, CLAY, (CH)								14	
70	▨	Very stiff, tan and gray, CLAY, (CH)	125	23				2.37	M.S.	15	-48.0
	▨	Very stiff, tan and gray, CLAY, (CH)								16	
80	▨	Hard, tan and gray, CLAY, (CH) with ferrous stains	129	20				4.01	YLD.	17	-58.0
	▨	Very stiff, tan and gray, CLAY, (CH) with trace sand								18	
90	▨	Very stiff, tan and gray, CLAY, (CH)	124	25				3.84	SLS (60°)	19	-68.0
	▨	Very stiff, tan and gray, CLAY, (CH)								20	
100	▨	Stiff, tan and gray, CLAY, (CL) with silt and silt pockets	127	29				1.45	YLD.	21	-78.0
	▨	Stiff, tan and gray, CLAY, (CH)								22	
110	▨	Medium stiff, tan and gray, CLAY, (CL) with silt and sand lenses	121	25				0.73	M.S.	23	-88.0
	▨	Stiff, tan and gray, CLAY, (CL) with silt and silt lenses								24	
120	▨	Stiff, tan and gray, CLAY, (CL) with silt and sand lenses	120	32				1.01	YLD.	25	-98.0
		Bottom of hole at 120 feet Backfilled with grout upon completion.									
130											-108.0
140											-118.0



BORING NO. 28	STA.:	WATER LEVEL: 20' ATD
LATITUDE: 30.38517	OFFSET:	
LONGITUDE: -91.08747	DATE TAKEN: 1/14/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 29

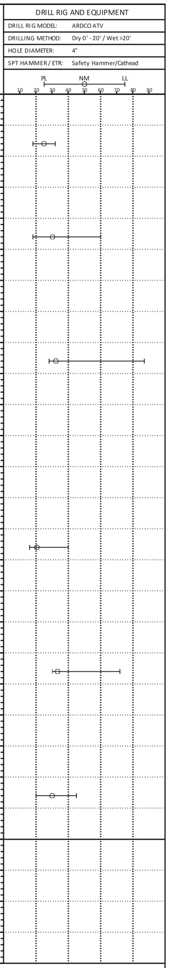
DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0											21.9
	▨	Very stiff, brown, CLAY, (CL) with silt and silt lenses								1	
	▨	Very stiff, brown, CLAY, (CL) with silt	123	19	43	25		3.96	Crumble	2	
10	▨	Very stiff, brown, CLAY, (CL) with silt	118	15				2.29	Crumble	3	11.9
	▨	Stiff, tan and gray, CLAY, (CH)	114	42	93	65		1.06	SLS (45°)	4	
20	▨	Stiff, tan and gray, CLAY, (CH)								5	1.9
	▨	Stiff, tan and gray, CLAY, (CH)	111	35				1.55	M.S.	6	
30	▨	Very stiff, tan and gray, CLAY, (CH)								7	-8.1
	▨	Very stiff, tan and gray, CLAY, (CH)	118	38	88	61		2.13	SLS (60°)	8	
40	▨	Very stiff, tan and gray, CLAY, (CH)								9	-18.1
	▨	Stiff, tan and gray, CLAY, (CH)	113	39				1.80	M.S.	10	
50	▨	Very stiff, tan and gray, CLAY, (CH)								11	-28.1
	▨	Stiff, tan and gray, CLAY, (CH)	123	29	74	46		1.45	M.S.	12	
60	▨	Very stiff, tan and gray, CLAY, (CH)								13	-38.1
	▨	Very stiff, tan and gray, CLAY, (CH)	127	25				3.10	YLD.	14	
70	▨	Very stiff, tan and gray, CLAY, (CH)								15	-48.1
	▨	Very stiff, tan and gray, CLAY, (CL) with silt	126	21				2.74	M.S.	16	
80	▨	Very stiff, tan and gray, CLAY, (CH)								17	-58.1
	▨	Very stiff, tan and gray, CLAY, (CH)	121	23				3.44	M.S.	18	
90	▨	Very stiff, tan and gray, CLAY, (CH)								19	-68.1
	▨	Stiff, tan and gray, CLAY, (CL) with sand and sand lenses	116	31				1.21	M.S.	20	
100	▨	Stiff, tan and gray, Sandy CLAY, (CL) with sand lenses								21	-78.1
	▨	Medium stiff, tan and gray, CLAY, (CL) with sand and sand lenses	119	30				0.63	M.S.	22	
110	▨	Medium stiff, gray, Sandy CLAY, (CL) with sand lenses								23	-88.1
	▨	Medium stiff, gray, CLAY, (CH) with sand lenses		26	61	42	62.0			24	
120	▨	Stiff, tan and gray, CLAY, (CH)								25	-98.1
		Bottom of hole at 120 feet Backfilled with grout upon completion.									
130											-108.1
140											-118.1



BORING NO. 29	STA.:	WATER LEVEL:
LATITUDE: 30.38533	OFFSET:	
LONGITUDE: -91.08761	DATE TAKEN: 1/18/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

BORING NO. 30

DEPTH Feet	GRAPHIC	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0											21.9
	▨	Medium stiff, tan, CLAY, (CL) with silt and silt streaks								1	
	▨	Stiff, tan, CLAY, (CL) with silt	128	23				1.42	M.S.	2	
10	▨	Medium stiff, tan and gray, Silty CLAY, (CL) with ferrous nodules	130	25	32	14		0.76@3.61	Bulge	3	11.9
	▨	Stiff, tan and gray, CLAY, (CH)	125	24				1.98	YLD.	4	
20	▨	Very stiff, tan and gray, CLAY, (CH)	125	29				2.39	M.S.	5	1.9
	▨	Stiff, tan and gray, CLAY, (CH)	122	30	60	42		1.57 1.71 REMOLD	SLS (40°)	6	
30	▨	Very stiff, tan and gray, CLAY, (CH)	123	28				2.25	Bulge	7	-8.1
	▨	Very stiff, tan and gray, CLAY, (CH)	121	40				2.12	SLS (60°)	8	
40	▨	Very stiff, tan and gray, CLAY, (CH)								9	-18.1
	▨	Stiff, tan and gray, CLAY, (CH)	118	32	87	59		1.50	M.S.	10	
50	▨	Very stiff, tan and gray, CLAY, (CH)								11	-28.1
	▨	Stiff, tan and gray, CLAY, (CH)	121	32				1.69	M.S.	12	
60	▨	Very stiff, tan and gray, CLAY, (CH)								13	-38.1
	▨	Very stiff, tan and gray, CLAY, (CH)	119	24				2.30	YLD.	14	
70	▨	Very stiff, tan and gray, CLAY, (CH) with trace silt and silt streaks								15	-48.1
	▨	Very stiff, tan and gray, Silty CLAY, (CL)	131	21	40	24		2.56	M.S.	16	
80	▨	Very stiff, tan and gray, CLAY, (CH)								17	-58.1
	▨	Very stiff, tan and gray, CLAY, (CH)	122	29				3.38	Bulge	18	
90	▨	Very stiff, tan and gray, CLAY, (CH) with trace sand and sand streaks								19	-68.1
	▨	Stiff, tan and gray, CLAY, (CH) with silt streaks	117	33	72	42		0.98 1.64 REMOLD	SLS (50°)	20	
100	▨	Very stiff, tan and gray, CLAY, (CL) with sand and sand lenses								21	-78.1
	▨	Medium stiff, tan and gray, CLAY, (CL) with sand and 2" sandy clay layer	118	28				0.41 0.61 REMOLD	SLS (50°)	22	
110	▨	Very stiff, tan and gray, CLAY, (CL) with sand, sand lenses and 1" sandy clay layer								23	-88.1
	▨	Medium stiff, gray, CLAY, (CL) with silt	118	30	45	25		0.68 0.55 REMOLD		24	
120	▨	Stiff, gray, Sandy CLAY, (CL) with sand lenses								25	-98.1
		Bottom of hole at 120 feet Backfilled with grout upon completion.									
130											-108.1
140											-118.1



BORING NO. 30	STA.:	WATER LEVEL:
LATITUDE: 30.38550	OFFSET:	
LONGITUDE: -91.08789	DATE TAKEN: 1/15/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL

▨ CH

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
△	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
PROFESSIONAL ENGINEER
08-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-10				
PARISH	EAST BATON ROUGE	DESIGNED:		NO.	DATE
FEDERAL PROJECT		CHECKED:		REVISION DESCRIPTION	BY
PROJECT	12-CS-HC-0044	DETAILED	CMC 10/11/2013		
		CHECKED	JMA		
		DATE	3/20/2014		
		SHEET	1 OF 1		

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

Report Form: LADOTD - ENGLISH Project File: P:\16\16710051\00\GINT\CITY PARISH - PICARDY-PERKINS - HIGHLAND-BURBANK BORING LOGS.GPJ

3/20/14 10:46

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Failing 1500
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0										22.5
	Very stiff, brown and gray, CLAY, (CL) with silt, (fill)								1	
	Very stiff, brown and gray, Silty CLAY, (CL) (fill)								2	
	Very stiff, brown and light gray, Silty CLAY, (CL) with ferrous nodules, (fill)								3	
10		123	18	43	23		1.44	M.S.	4	12.5
	Stiff, tan and light gray, CLAY, (CL) with silt and ferrous nodules, (fill)									
	Medium stiff, tan and light gray, Silty CLAY, (CL) with ferrous nodules	122	26	37	20		1.00	YLD.	5	
20	Medium stiff, light gray, Very Silty CLAY, (CL) with sand	128	24	28	10	89.0	0.58@7.57	M.S.	6	2.5
	Medium stiff, light gray, Sandy CLAY, (CL) with 2½" clay sand layer	132	20	23	10	65.0	0.65@9.58	YLD.	7	
30	Stiff, light gray, Sandy CLAY, (CL)								8	-7.5
	Very stiff, light gray, Silty CLAY, (CL) with sand pockets and ferrous nodules	132	21	31	15	92.0	2.04	YLD.	9	
40	Stiff, tan and gray, CLAY, (CH)	127	27	95	65		0.79 1.81 REMOLD	SLS (45°)	10	-17.5
	Stiff, tan and gray, CLAY, (CH)								11	
50	Stiff, tan and gray, CLAY, (CH) with silt and sand pockets	124	31	55	32		1.94	M.S.	12	-27.5
	Very stiff, tan and light gray, CLAY, (CL) with silt								13	
60	Very stiff, tan and gray, CLAY, (CH) with calcareous nodules	125	29	67	46		2.37	M.S.	14	-37.5
	Very stiff, tan and gray, CLAY, (CH) with ferrous nodules								15	
70	Very stiff, tan and light gray, Silty CLAY, (CL) with sand streaks and sand pockets	127	22	39	23		2.61	M.S.	16	-47.5
	Very stiff, tan and light gray, CLAY, (CH) with calcareous nodules								17	
80	Very stiff, tan and gray, CLAY, (CH) with calcareous nodules and claystone nodules	130	23	62	44	94.0	2.61	M.S.	18	-57.5
	Very stiff, tan and gray, CLAY, (CL) with silt and ferrous nodules								19	
90	Very stiff, tan and light gray, CLAY, (CH) with sand pockets and ferrous nodules								20	-67.5
	Tan and light gray, Clayey SILT, (CL-ML) with 2 x ½" sandy clay layers	124	24	24	6	81.0	2.24@37.57	YLD.	21	
100	Stiff, tan and light gray, CLAY, (CH) with sand streaks and sand pockets								22	-77.5
	Very stiff, gray, CLAY, (CH)	129	24	62	44		2.66	YLD.	23	
110	Very stiff, light gray, CLAY, (CH)								24	-87.5
	Very stiff, tan and gray, CLAY, (CH)	131	23	6	NP		3.61	YLD.	25	
120	Very stiff, tan and light gray, CLAY, (CH) with calcareous nodules								26	-97.5
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-107.5
140										-117.5

BORING NO. 31	STA.:	WATER LEVEL:
LATITUDE: 30.38639	OFFSET:	
LONGITUDE: -91.08650	DATE TAKEN: 9/16/2013	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: Marsh Buggy Mounted
DRILLING METHOD: Wet Rotary
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Hydraulic Hammer

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	6" water at surface NO RECV.								1	3.6
	Stiff, gray, Very Silty CLAY, (CL)	128	23	31	13		1.04	M.S.	2	
	Medium stiff, light gray, Very Silty CLAY, (CL)								3	
	Stiff, light gray, Very Silty CLAY, (CL)	128	24	33	14		1.37@2.78	M.S.	4	
10	Very stiff, gray, Very Silty CLAY, (CL)	132	23	33	17		2.09	M.S.	5	-6.4
	Stiff, gray, CLAY, (CL) with silt								6	
20	Very stiff, gray, Very Silty CLAY, (CL)	133	22	34	19		2.14	YLD.	7	-16.4
	Stiff, tan, CLAY, (CH) with calcareous nodules	122	26	54	33		1.94@9.58	M.S.	8	
30	Very stiff, tan, CLAY, (CH)								9	-26.4
	Very stiff, tan, CLAY, (CH)								10	
40	Stiff, red and gray, CLAY, (CH)	123	35	81	59		1.85 1.94 REMOLD	SLS (60°)	11	-36.4
	Very stiff, tan, CLAY, (CH)								12	
50	Very stiff, red and gray, CLAY, (CH)	132	28				3.12	M.S.	13	-46.4
	Very stiff, tan and gray, CLAY, (CH)								14	
60	Very stiff, tan and gray, CLAY, (CH)	131	23	59	41		2.89	M.S.	15	-56.4
	Very stiff, tan and gray, CLAY, (CH)								16	
70	Very stiff, tan and gray, Silty CLAY, (CL)	135	21				3.18	YLD.	17	-66.4
	Medium stiff, tan, Very Silty CLAY, (CL) with 4" clay layer	136	26	29	11		0.60@29.58	YLD.	18	
80	Medium stiff, tan, Very Silty CLAY, (CL)								19	-76.4
	Soft, tan, Clayey ELASTIC SILT, (CL-ML)	127	25				0.49	M.S.	20	
90	Very stiff, red and gray, CLAY, (CH)								21	-86.4
	Medium stiff, gray, CLAY, (CL) with silt	130	22	49	31		0.90	YLD.	22	
100	Very stiff, red and gray, CLAY, (CH)	127	32	67	43		2.16	M.S.	23	-96.4
	Very stiff, tan, CLAY, (CH)								24	
110	Stiff, tan and gray, CLAY, (CH) with silt	127	24				1.14	YLD.	25	-106.4
	Very stiff, tan and gray, CLAY, (CH)								26	
120	Very stiff, gray, CLAY, (CH)	129	23				3.90	M.S.	27	-116.4
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-126.4
140										-136.4

BORING NO. 32	STA.:	WATER LEVEL:
LATITUDE: 30.38322	OFFSET:	
LONGITUDE: -91.08783	DATE TAKEN: 1/6/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

DRILL RIG AND EQUIPMENT
DRILL RIG MODEL: ARDCO ATV
DRILLING METHOD: Dry 0' - 20' / Wet >20'
HOLE DIAMETER: 4"
SPT HAMMER / ETR: Safety Hammer/Cathead

DEPTH Feet	SOIL TYPE AND COLOR ⊗	WET DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200	SPT or UU	FAILURE MODE/ SPT TERMINATION	SAMPLE TYPE NUMBER	ELEVATION
0	Brown, CLAY, (CL) with silt and wood								1	27.9
	Stiff, brown, CLAY, (CL) with silt and silt streaks	125	26				1.31	Bulge	2	
	Stiff, tan, CLAY, (CL) with silt	124	23	47	29		1.15	YLD.	3	
	Medium stiff, tan, CLAY, (CL) with silt	121	25				0.87	M.S.	4	
10	Stiff, tan, CLAY, (CL)								5	17.9
	Very stiff, tan and gray, CLAY, (CH) with ferrous nodules	130	20				3.19	YLD.	6	
20	Stiff, tan and gray, CLAY, (CH)	123	25				1.40	YLD.	7	7.9
	Stiff, tan and gray, CLAY, (CH)								8	
30	Soft, gray, Silty CLAY, (CL)	139	24	34	18		0.31@11.60	YLD.	9	-2.1
	Medium stiff, gray, Silty CLAY, (CL)								10	
40	Very stiff, gray, CLAY, (CL) with silt	125	21				2.13	YLD.	11	-12.1
	Stiff, gray, CLAY, (CL) with silt								12	
50	Very stiff, gray, CLAY, (CL) with silt	126	21				2.36	YLD.	13	-22.1
	Very stiff, tan and gray, CLAY, (CL)								14	
60	Very stiff, tan and gray, CLAY, (CH)	126	26				2.63	YLD.	15	-32.1
	Very stiff, tan and gray, CLAY, (CH) with calcareous nodules and trace silt								16	
70	Very stiff, tan and gray, CLAY, (CL) with calcareous nodules and silt	131	20				2.54	M.S.	17	-42.1
	Very stiff, tan and gray, CLAY, (CL) with silt and silt pockets								18	
80	Hard, tan and gray, CLAY, (CH)	119	19				4.31	YLD.	19	-52.1
	Very stiff, tan and gray, CLAY, (CH)								20	
90	Stiff, tan and gray, CLAY, (CL) with silt and silt lenses	115	22				1.55	V.S.	21	-62.1
	Very stiff, tan and gray, CLAY, (CL) with silt and calcareous nodules								22	
100	Very stiff, tan and gray, CLAY, (CH) with calcareous nodules	118	22				3.24	YLD.	23	-72.1
	Medium stiff, tan, Sandy CLAY, (CL) with sand lenses								24	
110	Medium dense, tan and gray, Clayey SAND, (SC)	129	22			36.0	0.46@43.61	YLD.	25	-82.1
	Very stiff, tan and gray, CLAY, (CH)								26	
120	Stiff, tan and gray, CLAY, (CH)	115	35				0.44 1.36 REMOLD	SLS (60°)	27	-92.1
	Bottom of hole at 120 feet Backfilled with grout upon completion.									
130										-102.1
140										-112.1

BORING NO. 33	STA.:	WATER LEVEL:
LATITUDE: 30.38344	OFFSET:	
LONGITUDE: -91.08808	DATE TAKEN: 1/16/2014	BACKFILL METHOD: Grout
LRS ID:	STR. NO.:	SQD. LDR.:

STANDARD ABBREVIATIONS & DEFINITIONS

▨ CL
▨ CH
▨ CL-ML

N.P. = Non-Plastic
ORG. = Organic

FAILURE MODE:

M.S.	= Multiple Shear	SL.	= Slump
S/S	= Slickensides	YLD.	= Yield
V.S.	= Vertical Shear	60 S.	= Shear Angle

SPT TERMINATION, AASHTO T 206

1 = 7.2.1 - 50 Blows Within A 6" Interval
2 = 7.2.2 - 100 Blows Total
3 = 7.2.3 - No Advancement for 10 Blows
4 = 7.2.4 - Sampler Driven the Entire 18"
5 = Non-standard

SOIL PROPERTIES

⊗	= SOIL TYPE nomenclature is based on ASTM D 2487
WET DENSITY	= Wet density of in-place soil, (pounds per cu. ft.) determined by AASHTO T 208.
MOISTURE CONTENT	= Moisture Content of in-place soil, expressed as a percentage of the dry weight of the soil, (%), determined by DOTD TR 403, Method B.
LIQUID LIMIT & PLASTICITY INDEX	= Atterberg limits and indices, DOTD TR 428
SPT	= Standard Penetration Test, AASHTO T 206, number of blows per each 6 inch increment, unless amount of penetration is shown
UU	= Unconsolidated Undrained triaxial test, AASHTO T 296, compressive strength (tons per sq. ft.), of one specimen confined at noted pressure (pounds per sq. in.)
C	= Soil cohesion (tons per sq. ft.)
ϕ	= Soil angle of internal friction (degrees)
Δ	= Unconsolidated Undrained triaxial test, AASHTO T 296, three specimens, (c - ϕ).
+	= Consolidated drained direct shear test, AASHTO T 236, (c - ϕ).
*	= Hydrometer test performed

MISCELLANEOUS:

■ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207
■ ☐ C-3	= Location and Identification of thin-walled tube sample, AASHTO T 207, with a portion of the sample saved for consolidation testing
☒ D-3	= Location and Identification of SPT sample, AASHTO T 206
NO RECV.	= No Recovery, unable to recover sample for testing or classification.
DIST.	= Disturbed sample recovered with thin-walled tube sampler.
▽ 24 HRS	= Water Table depth below ground surface recorded at noted time after completion of bore hole.
ETR =	= Energy Transfer Ratio determined according to ASTM D4633

CORRELATION OF PENETRATION RESISTANCE AND SOIL PROPERTIES

SOIL	DESIGNATION		"N" (blows per ft.)
SAND AND SILT	RELATIVE DENSITY	VERY LOOSE	LESS THAN 4
		LOOSE	4 - 10
		MEDIUM DENSE	10 - 30
		DENSE	30 - 50
		VERY DENSE	OVER 50
CLAY	CONSISTENCY	VERY SOFT	LESS THAN 2
		SOFT	2 - 4
		MEDIUM STIFF	4 - 8
		STIFF	8 - 15
		VERY STIFF	15 - 30
		HARD	OVER 30

LARRY DEAN SANT
License No. 35625
PROFESSIONAL ENGINEER
08-16-2014

THIS SIGNATURE AND SEAL IS AFFIXED TO THIS DRAWING AS CERTIFICATION THAT THE LABORATORY TESTING AND ANALYSIS WAS PERFORMED ACCORDING TO THE LISTED PROCEDURES. NO DESIGN COMPUTATIONS WERE PERFORMED OR REVIEWED BY ME.

FIGURE	A-11		
PARISH	EAST BATON ROUGE	DESIGNED:	
FEDERAL PROJECT		CHECKED:	
PROJECT	12-CS-HC-0044	DETAILED	CMC 10/11/2013
		CHECKED	JMA
		DATE	3/21/2014
		SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

Picardy-Perkins Connector Road

LOGS OF SOIL BORINGS

Field Book No.

GeoEngineers

ATTACHMENT B

Laboratory Test Results

Project Name: City of Baton Rouge - Picardy to Perkins Connector

Technical Responsibility: **Cathy Perkins**

Date: Feb-14

Project ID: 16710-051-00

Title: **Laboratory Supervisor**

BORING NUMBER	DEPTH (FT)	SOIL DESCRIPTION	MOISTURE %	UNIT WEIGHT (PCF)		ATTERBERG LIMITS			COMPRESSION TEST				TEST TYPE	COMMENTS
	FROM - TO			WET	DRY	LL	PL	PI	TSF	STRAIN %	CONFINING PRESSURE (KSF)	TYPE FAILURE		
1	0.0 - 2.0	Stiff tan silty clay with roots (CL)	16	117.6	101.7	41	20	21	1.37	4		Multiple Shear	UC,AL	
1	4.0 - 6.0	Stiff tan and light gray silty clay (CL)	24	128.0	103.0	40	21	19	1.5	5		Multiple Shear	UC,AL	
1	18.0 - 20.0	Stiff tan and light gray sandy clay with silt (CL)	22	124.3	102.1	44	15	29	1.71	8		Multiple Shear	UC,AL,M200	71.5 % fines
2	2.0 - 4.0	Very stiff tan, and light gray clay with silt (CL) - (fill)	21	115.0	95.1	46	19	27	3.18	8		Multiple Shear	UC,AL	
2	8.0 - 10.0	Stiff tan and gray silty clay (CL)	19	121.4	102.2	36	17	19	1.78	6		Multiple Shear	UC,AL	
2	13.0 - 15.0	Very stiff tan and light gray clay with silt (CL)	22	127.8	105.0	42	18	24	2.68	8		Multiple Shear	UC,AL	
3	0.0 - 2.0	Stiff tan, light gray and brown very silty clay (with roots (CL)	21	121.7	101.0	35	20	15	1.93	4		Multiple Shear	UC,AL	
3	4.0 - 6.0	Very stiff tan, red and light gray silty clay (CL)	19	123.0	103.7	40	17	23	2.31	7		Multiple Shear	UC,AL	
3	13.0 - 15.0	Stiff tan and light gray clay with ferrous nodules (CH)	28	123.5	96.8				1.48	15		Yield	UC	
4	2.0 - 4.0	Very stiff gray clay with silt, wood and 2" silty clay layer (CL)	26	130.2	103.3	45	19	26	3.94	15		Yield	UC,AL	
4	8.0 - 10.0	Stiff gray clay with silt, roots and ferrous nodules (CL)	24	124.6	100.2	43	19	24	1.78	15		Yield	UC,AL	
4	18.0 - 20.0	Stiff light gray clay (CH)	24	128.3	103.2				1.44	15		Yield	UC	
5	0.0 - 2.0	Stiff gray clay with roots (CH)	17	109.5	93.5	50	23	27	1.6	5		Multiple Shear	UC,AL	
5	6.0 - 8.0	Medium gray and light gray clay with silt (CL)	29	129.8	100.7	44	18	26	0.76	15		Yield	UC,AL	
5	13.0 - 15.0	Stiff tan and light gray clay with ferrous nodules and calcareous nodules (CH)	26	127.5	100.9				1.13	15		Yield	UC	
6	2.0 - 4.0	Stiff tan, gray, and light gray clay with silt and trace organic matter (CL)	25	124.9	100.2	48	17	31	1.21	15		Yield	UC,AL	
6	6.0 - 8.0	Stiff light gray and gray clay with silt (CL)	27	127.9	100.6	45	20	25	1.17	15		Yield	UC,AL	
6	18.0 - 20.0	Stiff light gray clay with silt, ferrous nodules and calcareous pockets (CL)	27	124.2	97.8	48	18	30	1.06	15		Yield	UC,AL	
7	0.0 - 2.0	Very stiff dark gray clay with silt (CL)	25	125.2	100.1	48	20	28	2.38	7		Multiple Shear	UC,AL	
7	4.0 - 6.0	Medium gray and light gray clay with silt and calcareous nodule pockets (CL)	27	122.0	95.7	46	19	27	0.83	8		Multiple Shear	UC,AL	
7	8.0 - 10.0	Stiff light gray silty clay with ferrous nodules and calcareous nodule pockets (CL)	24	127.8	102.7				1.32	13		Multiple Shear	UC	
7	13.0 - 15.0	Medium tan, gray, and light gray with calcareous nodules and ferrous nodules (CH)	24	126.2	101.6				0.6	15		Yield	UC	

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

GeoEngineers Earth Science + Technology

Laboratory Test Results

8	2.0 - 4.0	Very stiff tan, gray, and dark gray clay with roots (CH)	17	117.4	100.7	55	17	38	3.57	5		Multiple Shear	UC,AL	
8	6.0 - 8.0	Stiff gray and light gray clay with ferrous nodules (CH)	28	126.7	99.2	48	19	29	1.02	11		Multiple Shear	UC,AL	
8	8.0 - 10.0	Medium tan and light gray clay with silt, calcareous nodules and ferrous nodules (CL)	27	120.9	95.0				0.82	13		Multiple Shear	UC	
9	2.0 - 4.0	Stiff tan clay with silt (CL)	25			49	18	31					MC,AL	
9	4.0 - 6.0	Medium tan and gray clay with silt and ferrous nodules (CL)	26	118.7	94.4				0.5	15	0.29	Yield	UU	
9	8.0 - 10.0	Medium tan and gray clay with silt and calcareous nodules (CL)	30	125.5	96.3				0.52	15		Yield	UC	
9	13.0 - 15.0	Soft tan and gray clay with silt (CL)	25	129.8	103.7				0.44	11	0.81	Bulge	UU	
9	18.0 - 20.0	Medium tan and gray clay with silt (CL)	24	127.3	103.0				0.57	15		Yield	UC	
10	2.0 - 4.0	Medium tan and gray clay with ferrous nodules (CH)	31	125.8	96.1				0.84	15		Yield	UC	
10	4.0 - 6.0	Medium tan and gray clay with silt and calcareous nodules (CL)	28	127.1	99.6	42	20	22	0.68	15	0.29	Yield	UU,AL	
10	8.0 - 10.0	Stiff tan and gray clay with silt, calcareous nodules and ferrous nodules (CL)	24	126.8	102.4				1.68	15		Yield	UC	
10	13.0 - 15.0	Medium tan and gray clay (CH)	23	127.2	103.7				0.83	15		Yield	UC	
10	18.0 - 20.0	Stiff tan and gray clay (CH)	24	131.9	106.4				1.39	15		Yield	UC	
11	4.0 - 6.0	Stiff tan and light gray clay with silt, ferrous nodules and calcareous nodules (CL)	27	127.0	100.4	42	22	20	1.09	11	0.29	Multiple Shear	UU,AL	
11	8.0 - 10.0	Stiff tan and light gray silty clay with ferrous streaks and calcareous nodules (CL)	23	123.7	100.8	39	16	23	1.28	12		Multiple Shear	UC,AL	
11	18.0 - 20.0	Stiff tan and light gray clay with silt and calcareous nodules (CL)	25	128.6	103.1	43	19	24	1.25	15		Yield	UC,AL	
11	23.0 - 25.0	Dense tan and light gray clayey silt with sand (CL-ML)	25	125.8	100.9	27	20	7	0.83	14	1.38	Multiple Shear	UU,AL,M200	87.6 % fines
11	33.0 - 35.0	Very stiff gray clay with sand (CL)	23	129.6	105.0				2.3	15		Yield	UC,M200	85.2 % fines
11	43.0 - 45.0	Very stiff tan and gray clay (CH)	28	128.1	99.9	72	17	55	1.81 2.01	5 9		SLS (60°) Multiple Shear	UC,AL Remold	
11	53.0 - 55.0	Very stiff tan and light gray clay (CH)	24	126.8	102.4				2.6	11		Multiple Shear	UC	
11	63.0 - 65.0	Very stiff tan and light gray clay with ferrous nodules and calcareous nodules (CH)	37	118.1	86.2	70	24	46	1.26 2.19	3 6		SLS (40°) Multiple Shear	UC,AL Remold	
11	73.0 - 75.0	Stiff tan and light gray clay with shell fragments (CH)	28	125.6	98.5				1.28	15		Yield	UC	
11	88.0 - 90.0	Stiff tan clay (CH)	35	124.7	92.2				1.98	12		Multiple Shear	UC	
11	98.0 - 100.0	Dense tan silty sand with clay (SM)	24	131.8	106.0	22	17	5	0.49	6		Multiple Shear	UC,AL	

Disclaimer: The results presented relate only to those samples tested.

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

ATTACHMENT B

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Laboratory Test Results

11	108.5 - 110.0	Very dense tan and light gray silty sand (SM)											Dry Sieve	44 % fines
12	2.0 - 4.0	Medium gray very silty clay (CL)	24	138.9	111.9	28	19	9	0.71	6		Multiple Shear	UC,AL	
12	6.0 - 8.0	Stiff gray very silty clay (CL)	23	133.0	108.5	26	12	14	1.21	9	0.4	Multiple Shear	UU,AL	
12	13.0 - 15.0	Very stiff gray silty clay (CL)	21	133.8	110.9	35	15	20	2.33	15		Yield	UC,AL	
12	23.0 - 25.0	Stiff gray clay (CH)	41	120.6	85.8	89	28	61	0.75	1		SLS (60°)	UC,AL	
									1.44	7		Multiple Shear	Remold	
12	33.0 - 35.0	Stiff tan and gray clay (CH)	25	125.3	100.4	60	18	42	1.68	12	1.96	Bulge	UU,AL	
12	43.0 - 45.0	Very stiff tan and gray clay with silt (CL)	20	131.8	110.3	46	13	33	2.22	15		Yield	UC,AL	
12	53.0 - 55.0	Medium tan silty clay (CL)	29	125.7	97.7	41	19	22	0.52	15		Yield	UC,AL	
12	63.0 - 65.0	Tan clayey silt (CL-ML)	27	123.5	97.6	23	18	5	0.47	15	3.69	Yield	UU,AL	
12	73.0 - 75.0	Medium tan and gray clay with silt (CL)	24	128.8	103.6				0.69	8		Multiple Shear	UC	
12	83.0 - 85.0	Stiff gray silty clay (CL)	25	128.8	103.5	40	14	26	1.36	15		Yield	UC,AL	
12	93.0 - 95.0	Medium tan and gray clay with shell fragments (CH)	34	120.5	89.9				0.98	15		Yield	UC	
12	108.0 - 110.0	Very stiff tan and gray clay (CH)	22	128.0	105.0				2.15	15		Yield	UC	
12	118.0 - 120.0	Very stiff tan and gray clay with silt (CL)	24	129.1	104.2				2.13	15		Yield	UC	
13	2.0 - 4.0	Medium tan and gray very silty clay (CL)	23	120.7	98.0				0.55	8		Multiple Shear	UC	
13	4.0 - 6.0	Medium light gray clay with silt and ferrous nodules (CL)	28	133.5	104.1	44	19	25	0.91	15		Yield	UC,AL	
13	6.0 - 8.0	Medium light gray silty clay with ferrous nodules (CL)	28	126.0	98.5				0.84	15		Yield	UC	
13	8.0 - 10.0	Medium tan and gray clay with silt (CL)	27	126.0	99.1				0.84	15		Yield	UC	
13	13.0 - 15.0	Stiff tan and gray clay with silt (CL)	25	134.5	107.5				1.62	15		Yield	UC	
13	18.0 - 20.0	Stiff tan and gray clay with calcareous nodules (CH)	24	123.0	98.9				1.53	15		Yield	UC	
13	23.0 - 25.0	Very stiff gray clayey silt (CL-ML)	36	133.8	98.2	21	15	6	2.55	15	1.38	Yield	UU,AL	
13	33.0 - 35.0	Stiff tan and gray clay with silt (CL)	25	130.7	104.2				1.33	15		Yield	UC	
13	43.0 - 45.0	Stiff tan and gray clay (CH)	34	130.5	97.3	79	26	53	1.62	4		SLS (60°)	UC,AL	
									1.61	6		Multiple Shear	Remold	
13	53.0 - 55.0	Very stiff tan and gray clay with ferrous nodules (CH)	24	124.9	100.8				2.67	13		Bulge	UC	
13	63.0 - 65.0	Stiff tan and gray clay (CH)	36	126.3	92.7				1.18	2		SLS (60°)	UC	
									1.51	6		Multiple Shear	Remold	
13	73.0 - 75.0	Stiff tan and gray clay (CH)	35	123.7	91.5				0.76	3		SLS (45°)	UC	
									1.77	6		Multiple Shear	Remold	
13	83.0 - 85.0	Very stiff tan and gray clay (CH)	24	125.5	100.9				2.77	4		Multiple Shear	UC	
13	98.0 - 100.0	Soft tan and gray very silty clay with sand (CL)	24	124.2	100.2				0.18	15	5.7	Yield	UU	
13	103.0 - 105.0	Firm tan and gray clayey sand (SC)	22	124.8	102.7				1.87	15	5.99	Yield	UU,M200	46.2 % fines

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

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GeoEngineers
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Laboratory Test Results

13	113.0 - 115.0	Stiff tan and gray clay (CH)	36	124.8	91.9				1.93	5		SLS (60°)	UC	
14	3.0 - 5.0	Stiff gray clay (CH)	24	121.1	97.6	52	16	36	1.15	15		Yield	UC,AL	
14	8.0 - 10.0	Soft tan and gray clay with silt and silt streaks (CL)	29	132.1	102.7	43	17	26	0.26	15	0.52	Yield	UU,AL	
14	13.0 - 15.0	Stiff tan and gray clay with silt pockets and ferrous nodules (CH)	25	128.0	102.8				1.64	15		Yield	UC	
14	23.0 - 25.0	Very stiff gray very silty clay with silt streaks (CL)	20	131.3	109.7	32	13	19	2.61	10		Multiple Shear	UC,AL	
14	33.0 - 35.0	Stiff tan and gray clay (CH)	36	118.8	87.1				1.98	6		Multiple Shear	UC	
14	43.0 - 45.0	Very stiff tan and gray clay (CH)	31	124.0	95.0	64	15	49	2.74	14		Multiple Shear	UC,AL	
14	53.0 - 55.0	Stiff tan and gray clay with calcareous nodules (CH)	25	120.1	96.2				1.55	6		SLS (50°)	UC	
14	58.0 - 60.0	Very stiff tan and gray clay with calcareous nodules (CH)	30	115.9	89.4	80	24	56	2.28	4		Multiple Shear	UC,AL	
15	0.0 - 2.0	Medium brown clay with silt and roots (CL)	37	119.1	86.9	47	19	28	0.91	15		Yield	UC,AL	
15	3.0 - 5.0	Stiff tan and gray clay with silt and ferrous nodules (CL)	26	124.6	98.7				1.07	15		Yield	UC	
15	8.0 - 10.0	Medium tan and gray clay with silt and silt streaks and ferrous nodules (CL)	26	127.1	100.9				0.98	14	0.52	Bulge	UU	
15	13.0 - 15.0	Stiff tan and gray clay with silt streaks (CH)	25	120.3	96.6				1.26	6		Multiple Shear	UC	
15	18.0 - 20.0	Stiff tan and gray clay with silt and ferrous nodules (CL)	24	128.9	103.9	45	16	29	1.22	15		Yield	UC,AL	
15	28.0 - 30.0	Stiff tan and gray very silty clay (CL)	23	129.7	105.6	30	13	17	1.16	15		Yield	UC,AL	
15	38.0 - 40.0	Stiff tan and gray clay with silt streaks (CH)	28	122.5	95.5				1.27	6		Multiple Shear	UC	
15	48.0 - 50.0	Stiff tan and gray clay (CH)	35	119.2	88.5				1.5	4		Multiple Shear	UC	
15	58.0 - 60.0	Very stiff tan and gray clay (CH)	24	123.0	99.1				2.28	15		Yield	UC	
16	3.0 - 5.0	Stiff tan and gray clay (CH)	21			50	17	33					MC,AL	
16	8.0 - 10.0	Medium tan and gray silty clay with ferrous nodules (CL)	24	122.3	98.5	40	17	23	0.98	14	0.52	Bulge	UU,AL	
16	13.0 - 15.0	Stiff tan and gray clay (CH)	25	126.8	101.2				1.26	9		Multiple Shear	UC	
16	18.0 - 20.0	Very stiff tan and gray clay (CH)	21	128.6	106.4	58	18	40	2.5	15		Yield	UC,AL	
16	28.0 - 30.0	Stiff tan and gray clay (CH)	31	123.7	94.7	55	20	35	1.68	7		Multiple Shear	UC,AL	
16	38.0 - 40.0	Stiff tan and gray clay (CH)	34	121.9	91.0				1.46 1.41	2 7		SLS (45°) Multiple Shear	UC Remold	
16	48.0 - 50.0	Very stiff tan and gray clay (CH)	28	122.0	95.2	69	23	46	2.25	13		Multiple Shear	UC,AL	
16	58.0 - 60.0	Stiff tan and gray clay (CH)	27	127.1	100.0				2.05	3		Multiple Shear	UC	
17	3.0 - 5.0	Soft gray clay with silt streaks (CH)	25	120.6	96.7	57	18	39	0.43	12	0.23	Bulge	UU,AL	
17	8.0 - 10.0	Soft gray clay with silt and silt pockets (CL)	26	125.5	99.3				0.37	15	0.52	Yield	UU	
17	13.0 - 15.0	Medium gray clay with silt streaks (CH)	27	124.0	98.0	58	18	40	0.97	9	0.81	Bulge	UU,AL	
17	18.0 - 20.0	Soft gray clay with silt and silt streaks (CL)	26	124.7	99.2				0.33	6	1.09	Multiple Shear	UU	

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Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

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Laboratory Test Results

17	23.0 - 25.0	Medium gray clay with silt (CL)	23	127.5	103.3	41	17	24	0.91	15	1.38	Yield	UU,AL	
17	28.0 - 30.0	Stiff tan and gray clay with silt (CL)	25	119.9	96.4				1.94	13		Multiple Shear	UC	
17	38.0 - 40.0	Stiff tan and gray clay (CH)	40	117.2	83.9				1.3 1.3	4 6		SLS (50°) Multiple Shear	UC Remold	
17	48.0 - 50.0	Very stiff tan and gray clay (CH)	34	119.8	89.3				2.11	6		SLS (60°)	UC	
17	58.0 - 60.0	Very stiff tan and gray clay (CH)	28	126.1	98.5				2.26	3		SLS (60°)	UC	
20	4.0 - 6.0	Stiff brown and gray very silty clay (CL) - (fill)	22	127.2	104.7	32	17	15	1.55	10		Vertical Shear	UC,AL	
20	8.0 - 10.0	Stiff brown and gray silty clay (CL) - (fill)	21	125.7	103.8	36	17	19	1.12	7		Vertical Shear	UC,AL	
20	23.0 - 25.0	Stiff tan and light gray clay (CH)	40	123.7	88.5	103	29	74	1.28	3		SLS (45°)	UC,AL	
20	33.0 - 35.0	Stiff tan and light gray clay (CH)	34	122.9	91.5	81	26	55	0.88 1.72	2 6		SLS (45°) Multiple Shear	UC,AL Remold	
20	43.0 - 45.0	Very stiff tan and light gray clay (CH)	24	128.0	103.3				2.81	13		Vertical Shear	UC	
20	53.0 - 55.0	Very stiff tan and light gray clay (CH)	26	128.4	101.7				2.48	10		Multiple Shear	UC	
20	68.0 - 70.0	Stiff tan and light gray silty clay (CL)	22	125.1	102.2	36	17	19	1.23	15		Yield	UC,AL	
20	88.0 - 90.0	Stiff tan and light gray clay with sand (CL)	27	122.5	96.9				1.33	15		Yield	UC	
20	93.0 - 95.0	Very stiff tan and light gray clay with silt, sand streaks, and sand pockets (CL)	30	125.6	96.5				2.33	8		Vertical Shear	UC	
20	103.0 - 105.0	Medium tan and light gray silty clay with sand pockets, sand streaks, and 1" clayey sand layer (CL)	28	126.4	98.5				0.78	9		Multiple Shear	UC	
20	108.5 - 110.0	Very dense gray clayey silty sand (SC-SM)				26	22	4					AL	
20	118.0 - 120.0	Very dense gray clayey sand (SC)											Dry Sieve	34.4 % fines
21	2.0 - 4.0	Very stiff tan and light gray silty clay with silt lenses (CL) - (fill)	14	131.0	114.7	40	18	22	2.72	6		Multiple Shear	UC,AL	
21	6.0 - 8.0	Stiff tan and gray clay with silt (CL)	21	123.3	102.1	44	20	24	1.29	6		Multiple Shear	UC,AL	
21	13.0 - 15.0	Stiff tan and gray clay (CH)	24	125.9	102.0				1.89	15		Yield	UC	
21	28.0 - 30.0	Stiff tan and gray clay (CH)	35	119.4	88.4	72	25	47	1.54	12		Multiple Shear	UC,AL	
21	38.0 - 40.0	Stiff tan and gray clay (CH)							1.01 1.4	2 5		SLS (50°) Multiple Shear	UC Remold	
21	48.0 - 50.0	Stiff tan and gray clay (CH)	29	124.3	96.7				1.76	15		Yield	UC	
21	63.0 - 65.0	Stiff tan and gray clay (CH)	29	120.3	93.2	86	27	59	1.71	6		Multiple Shear	UC,AL	
21	73.0 - 75.0	Very stiff tan and light gray clay (CH)	25	119.2	95.2				2.66	12		Multiple Shear	UC	
21	83.0 - 85.0	Very stiff tan and light gray clay with silt (CL)	22	122.7	100.6	44	18	26	2.01	15		Yield	UC,AL	

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

ATTACHMENT B

Laboratory Test Results

21	93.0 - 95.0	Medium tan and light gray very sandy clay with 6" sand layer (CL)	23	118.2	96.3	30	16	14	0.71	5		Multiple Shear	UC,AL,M200	71.4 % fines
21	103.0 - 105.0	Dense light gray clayey silt with sand (CL-ML)											M200	90.7 % fines
21	113.5 - 115.0	Very dense light gray clayey silty sand (SC-SM)											Dry Sieve	54 % fines
22	4.0 - 6.0	Medium tan and gray clay with silt and roots (CL)	31	127.0	96.9	47	22	25	0.86	15		Yield	UC,AL	
22	13.0 - 15.0	Very stiff tan and light gray silty clay with ferrous nodules (CL)	28	127.6	99.7	38	14	24	2.17	15		Yield	UC,AL	
22	18.0 - 20.0	Stiff tan and light gray clay with silt streaks (CH)	27	130.1	102.6	59	17	42	1.31	9		Multiple Shear	UC,AL	
24	2.0 - 4.0	Medium tan and gray silty clay (CL)	27	127.7	100.7	38	20	18	0.85	8		Multiple Shear	UC,AL	
24	6.0 - 8.0	Very stiff tan and light gray silty clay with ferrous nodules (CL)	21	132.6	109.3	40	15	25	2.33	15		Yield	UC,AL	
24	13.0 - 15.0	Very stiff tan and light gray clay (CH)	21	134.0	111.0	55	16	39	3.25	15		Yield	UC,AL	
24	23.0 - 25.0	Medium tan and gray very sandy clay (CL)	25	133.2	106.9	26	15	11	0.66	10		Multiple Shear	UC,AL	
25	2.0 - 4.0	Stiff tan and light gray silty clay (CL)	27	120.4	94.6	40	21	19	1.04	10	0.17	Multiple Shear	UU,AL	
25	4.0 - 6.0	Medium tan and light gray silty clay with ferrous nodules (CL)	31	127.5	97.6	36	19	17	0.6	15		Yield	UC,AL	
25	8.0 - 10.0	Stiff tan and light gray clay with sand streaks (CH)	35	121.3	89.7	90	26	64	1.23	11		Multiple Shear	UC,AL	
25	28.0 - 30.0	Very stiff tan and light gray clay with trace sand (CH)	24	123.6	99.5	50	18	32	2.06	10		Multiple Shear	UC,AL,M200	95.2 % fines
26	2.0 - 4.0	Brown and gray silty clay with gravel (CL) - (Fill)	19			40	16	24					MC,AL	
26	4.0 - 6.0	Stiff brown, light gray, and gray clay with silt and ferrous nodules (CL) - (Fill)	21	130.2	107.4	41	16	25	2.1	15		Yield	UC,AL	
26	8.0 - 10.0	Very stiff brown, tan, and gray silty clay with gravel and ferrous nodules (CL) - (Fill)	21	131.3	108.6	40	16	24	2.14	15		Yield	UC,AL,M200	91.1 % fines
26	18.0 - 20.0	Stiff brown and gray silty clay with gravel, asphalt, and trace organic matter (CL) - (Fill)	22	128.6	105.3	37	15	22	1.52	15		Yield	UC,AL	
27	2.0 - 4.0	Stiff brown and gray very silty clay with large sand pocket and gravel (CL) - (Fill)	16	131.3	113.2	27	16	11	1.25	5		Multiple Shear	UC,AL	
27	4.0 - 6.0	Stiff tan and gray clay with silt and ferrous nodules (CL)	25	122.9	98.5	47	20	27	1.47	6		Multiple Shear	UC,AL	
27	8.0 - 10.0	Stiff tan and gray very silty clay with ferrous nodules (CL)	22	128.6	105.1	33	18	15	1.21	9		Multiple Shear	UC,AL	
27	23.0 - 25.0	Very stiff tan and gray clay with ferrous nodules (CH)	25	124.7	100.1	64	19	45	2.24	12		Multiple Shear	UC,AL	
28	0.0 - 2.0	Stiff tan clay with silt (CL)	23	124.4	101.2				1.91	9		Multiple Shear	UC	
28	3.0 - 5.0	Medium tan and gray silty clay with silt streaks and ferrous nodules (CL)	24	126.8	102.2	39	18	21	0.96	13	0.23	Bulge	UU,AL	
28	8.0 - 10.0	Soft tan clay with silt and silt pockets (CL)	22	124.9	102.4				0.39	15	0.52	Yield	UU	
28	13.0 - 15.0	Stiff tan clay with silt streaks (CH)	33	120.3	90.6				1.57	8		Multiple Shear	UC	

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11955 Lakeland Park Blvd. Suite 100 Baton Rouge, LA 70809

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Laboratory Test Results

28	18.0 - 20.0	Soft tan and gray clay with silt (CL)	29	124.3	96.3	45	18	27	0.42	6	1.09	Bulge	UU,AL	
28	23.0 - 25.0	Stiff tan clay with silt (CL)	29	127.4	98.7				1.23	14	1.38	Multiple Shear	UU	
28	28.0 - 30.0	Stiff tan and gray clay (CH)	32	123.1	93.5				1.46	1		SLS (60°)	UC	
									2.03	6		Multiple Shear	Remold	
28	33.0 - 35.0	Very stiff tan and gray clay (CH)	38	116.2	84.0				2.15	6		SLS (45°)	UC	
28	38.0 - 40.0	Stiff tan and gray clay (CH)	34	119.7	89.4	72	23	49	1.29	3		SLS (50°)	UC,AL	
									1.15	7		Multiple Shear	Remold	
28	48.0 - 50.0	Stiff tan and gray clay with silt (CL)	31	118.2	90.6	47	16	31	1.34	9		Multiple Shear	UC,AL	
28	58.0 - 60.0	Very stiff tan and gray clay (CH)	32	123.1	93.6	75	24	51	2.49	9		Multiple Shear	UC,AL	
28	68.0 - 70.0	Very stiff tan and gray clay (CH)	23	124.6	101.2				2.37	9		Multiple Shear	UC	
28	78.0 - 80.0	Hard tan and gray clay with ferrous stains (CH)	20	129.2	107.6				4.01	15		Yield	UC	
28	88.0 - 90.0	Very stiff tan and gray clay (CH)	25	123.6	98.7				3.84	6		SLS (60°)	UC	
28	98.0 - 100.0	Stiff tan and gray clay with silt and silt pockets (CL)	29	126.7	98.2				1.45	15		Yield	UC	
28	108.0 - 110.0	Medium tan and gray very silty clay (CL)	25	121.1	97.2				0.73	5		Multiple Shear	UC	
28	118.0 - 120.0	Stiff tan and gray clay with silt and sand lenses (CL)	32	119.5	90.3				1.01	15		Yield	UC	
29	3.0 - 5.0	Very stiff brown clay with silt (CL)	19	122.9	103.5	43	18	25	3.96	7		Crumble	UC,AL	
29	8.0 - 10.0	Very stiff brown clay with silt (CL)	15	118.1	103.1				2.29	6		Crumble	UC	
29	13.0 - 15.0	Stiff tan and gray clay (CH)	42	113.5	79.8	93	28	65	1.06	4		SLS (45°)	UC,AL	
29	23.0 - 25.0	Stiff tan and gray clay (CH)	35	110.8	82.1				1.55	5		Multiple Shear	UC	
29	33.0 - 35.0	Very stiff tan and gray clay (CH)	38	118.3	85.5	88	27	61	2.13	4		SLS (60°)	UC,AL	
29	43.0 - 45.0	Stiff tan and gray clay (CH)	39	113.1	81.3				1.8	7		Multiple Shear	UC	
29	53.0 - 55.0	Stiff tan and gray clay with trace silt (CH)	29	123.1	95.4	74	28	46	1.45	8		Multiple Shear	UC,AL	
29	63.0 - 65.0	Very stiff tan and gray clay (CH)	25	127.3	102.2				3.1	15		Yield	UC	
29	73.0 - 75.0	Very stiff tan and gray clay with silt (CL)	21	126.1	104.2				2.74	6		Multiple Shear	UC	
29	83.0 - 85.0	Very stiff tan and gray clay (CH)	23	121.3	98.4				3.44	11		Multiple Shear	UC	
29	93.0 - 95.0	Stiff tan and gray clay with sand and sand lenses (CL)	31	116.0	88.4				1.21	7		Multiple Shear	UC	
29	103.0 - 105.0	Medium tan and gray clay with sand and sand lenses (CL)	30	118.5	91.0				0.63	10		Multiple Shear	UC	
29	113.0 - 115.0	Medium gray clay with sand lenses (CH)	26			61	19	42					MC,AL,M200	62 % fines
30	3.0 - 5.0	Stiff tan clay with silt (CL)	23	128.2	104.5				1.42	10		Multiple Shear	UC	
30	8.0 - 10.0	Medium tan and gray very silty clay with ferrous nodules (CL)	25	130.2	104.3	32	18	14	0.76	14	0.52	Bulge	UU,AL	
30	13.0 - 15.0	Stiff tan and gray clay (CH)	24	124.9	100.6				1.98	15		Yield	UC	

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

ATTACHMENT B

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Earth Science + Technology

Laboratory Test Results

30	18.0 - 20.0	Very stiff tan and gray clay (CH)	29	124.7	97.0				2.39	10		Multiple Shear	UC	
30	23.0 - 25.0	Stiff tan and gray clay (CH)	30	121.5	93.3	60	18	42	1.57 1.71	3 6		SLS (40°) Multiple Shear	UC,AL Remold	
30	28.0 - 30.0	Very stiff tan and gray clay (CH)	28	122.6	95.8				2.25	12		Bulge	UC	
30	33.0 - 35.0	Very stiff tan and gray clay (CH)	40	120.7	86.4				2.12	5		SLS (60°)	UC	
30	43.0 - 45.0	Stiff tan and gray clay (CH)	32	118.1	89.3	87	28	59	1.5	7		Multiple Shear	UC,AL	
30	53.0 - 55.0	Stiff tan and gray clay (CH)	32	120.9	91.6				1.69	7		Multiple Shear	UC	
30	63.0 - 65.0	Very stiff tan and gray clay with silt traces (CH)	24	119.2	96.6				2.3	15		Yield	UC	
30	73.0 - 75.0	Very stiff tan and gray silty clay (CL)	21	131.0	108.8	40	16	24	2.56	13		Multiple Shear	UC,AL	
30	83.0 - 85.0	Very stiff tan and gray clay (CH)	29	121.6	94.5				3.38	8		Bulge	UC	
30	93.0 - 95.0	Stiff tan and gray clay with silt streaks (CH)	33	117.3	88.0	72	30	42	0.98 1.64	4 6		SLS (50°) Multiple Shear	UC,AL Remold	
30	103.0 - 105.0	Medium tan and gray clay with sand and 2" sandy clay layer (CL)	28	118.4	92.5				0.41 0.61	4 9		SLS (50°) Multiple Shear	UC Remold	
30	113.0 - 115.0	Medium gray clay with silt (CL)	30	118.2	91.1	45	20	25	0.68 0.55	7 8		SLS (45°) Multiple Shear	UC,AL Remold	
31	8.0 - 10.0	Stiff tan, gray and light gray clay with silt and ferrous nodules (CL) (Fill)	18	122.9	103.9	43	20	23	1.44	13		Multiple Shear	UC,AL	
31	13.0 - 15.0	Medium tan, gray and light gray silty clay with ferrous nodules (CL)	26	122.2	97.3	37	17	20	1	15		Yield	UC,AL	
31	18.0 - 20.0	Medium light gray very silty clay with sand (CL)	24	127.7	103.4	28	18	10	0.58	13	1.09	Multiple Shear	UU,AL,M200	88.8 % fines
31	23.0 - 25.0	Medium light gray very sandy clay with 2 1/2" clay sand layer (CL)	20	131.8	109.8	23	13	10	0.65	15	1.38	Yield	UU,AL,M200	65 % fines
31	33.0 - 35.0	Very stiff light gray very silty clay with sand pockets and ferrous nodules (CL)	21	131.9	108.7	31	16	15	2.04	15		Yield	UC,AL,M200	91.6 % fines
31	38.0 - 40.0	Stiff tan and gray clay (CH)	27	127.2	100.6	95	30	65	0.79 1.81	2 5		SLS (45°) Multiple Shear	UC,AL Remold	
31	48.0 - 50.0	Stiff tan and gray clay with silt and sand pockets (CH)	31	123.8	94.9	55	23	32	1.94	6		Multiple Shear	UC,AL	
31	58.0 - 60.0	Very stiff tan and gray clay with calcareous nodules (CH)	29	124.5	96.8	67	21	46	2.37	10		Multiple Shear	UC,AL	
31	68.0 - 70.0	Very stiff tan and light gray silty clay with sand streaks and sand pockets (CL)	22	127.4	104.1	39	16	23	2.61	6		Multiple Shear	UC,AL	
31	78.0 - 80.0	Very stiff tan and gray clay with calcareous nodules and clay stone nodules (CH)	23	130.3	106.2	62	18	44	2.61	5		Multiple Shear	UC,AL,M200	94.1 % fines

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Disclaimer: The results presented relate only to those samples tested. **Soil Description:** ASTM(D2487) AASHTO(M145) **Moisture Content:**

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Earth Science + Technology

Laboratory Test Results

31	93.0 - 95.0	Firm tan and light gray clayey silt with 2 x 1/2" sandy clay layers (CL-ML)	24	123.9	99.7	24	18	6	2.24	15	5.41	Yield	UU,AL,M200	80.8 % fines
31	103.0 - 105.0	Very stiff gray clay (CH)	24	128.6	103.9	62	18	44	2.66	15		Yield	UC,AL	
31	113.0 - 115.0	Very stiff tan and gray clay (CH)	23	130.7	106.4	61	18	43	3.61	15		Yield	UC,AL	
32	2.0 - 4.0	Stiff gray very silty clay (CL)	23	127.9	103.8	31	18	13	1.04	7		Multiple Shear	UC,AL	
32	6.0 - 8.0	Stiff light gray very silty clay (CL)	24	127.5	103.1	33	19	14	1.37	7	0.4	Multiple Shear	UU,AL	
32	8.0 - 10.0	Very stiff gray very silty clay (CL)	23	132.4	107.5	33	16	17	2.09	14		Multiple Shear	UC,AL	
32	18.0 - 20.0	Very stiff gray very silty clay (CL)	22	132.7	108.7	34	15	19	2.14	15		Yield	UC,AL	
32	23.0 - 25.0	Stiff tan clay with calcareous nodules (CH)	26	121.5	96.3	54	21	33	1.94	9	1.38	Multiple Shear	UU,AL	
32	38.0 - 40.0	Stiff red, gray, and tan clay (CH)	35	123.3	91.5	81	22	59	1.85	3		SLS (60°)	UC,AL	
									1.94	6		Multiple Shear	Remold	
32	48.0 - 50.0	Very stiff red, gray, and tan clay (CH)	28	131.7	103.1				3.12	8		Multiple Shear	UC	
32	58.0 - 60.0	Very stiff tan and gray clay (CH)	23	131.1	106.4	59	18	41	2.89	13		Multiple Shear	UC,AL	
32	68.0 - 70.0	Very stiff tan and gray silty clay (CL)	21	135.0	112.1				3.18	15		Yield	UC	
32	73.0 - 75.0	Medium tan very silty clay with 4" clay layer (CL)	26	135.5	107.4	29	18	11	0.6	15	4.26	Yield	UU,AL	
32	83.0 - 85.0	Very loose tan clayey silt (CL-ML)	25	127.3	101.5				0.49	12		Multiple Shear	UC	
32	93.0 - 95.0	Medium gray clay with silt (CL)	22	129.8	106.3	49	18	31	0.9	15		Yield	UC,AL	
32	98.0 - 100.0	Very stiff red, gray, and tan clay (CH)	32	127.0	96.4	67	24	43	2.16	6		Multiple Shear	UC,AL	
32	108.0 - 110.0	Stiff tan and gray clay with silt pockets (CH)	24	127.4	102.7				1.14	15		Yield	UC	
32	118.0 - 120.0	Very stiff gray clay (CH)	23	129.4	104.8				3.9	8		Multiple Shear	UC	
33	2.0 - 4.0	Stiff brown clay with silt and silt streaks (CL)	26	124.9	99.6				1.31	11		Bulge	UC	
33	4.0 - 6.0	Stiff tan clay with silt (CL)	23	123.6	100.4	47	18	29	1.15	15		Yield	UC,AL	
33	6.0 - 8.0	Medium tan clay with silt (CL)	25	121.0	96.5				0.87	11		Multiple Shear	UC	
33	13.0 - 15.0	Very stiff tan and gray clay with ferrous nodules (CH)	20	130.3	108.3				3.19	14		Yield	UC	
33	18.0 - 20.0	Stiff tan and gray clay with silt and ferrous nodules (CL)	25	122.5	98.4	44	19	25	1.4	15		Yield	UC,AL	
33	28.0 - 30.0	Soft gray silty clay (CL)	24	139.0	111.8	34	16	18	0.31	15	1.67	Yield	UU,AL	
33	38.0 - 40.0	Very stiff gray clay with silt (CL)	21	124.7	102.8				2.13	15		Yield	UC	
33	48.0 - 50.0	Very stiff gray clay with silt (CL)	21	126.4	104.6				2.36	15		Yield	UC	
33	58.0 - 60.0	Very stiff tan and gray clay (CH)	26	126.0	99.9				2.63	15		Yield	UC	
33	68.0 - 70.0	Very stiff tan and gray clay with silt and calcareous nodules (CL)	20	131.1	109.4				2.54	7		Multiple Shear	UC	
33	78.0 - 80.0	Hard tan and gray clay (CH)	19	118.8	99.7				4.31	15		Yield	UC	
33	88.0 - 90.0	Stiff tan and gray clay with silt and silt lenses (CL)	22	115.2	94.8				1.55	11		Vertical Shear	UC	

Disclaimer: The results presented relate only to those samples tested.

Soil Description: ASTM(D2487) AASHTO(M145) **Moisture Content:**

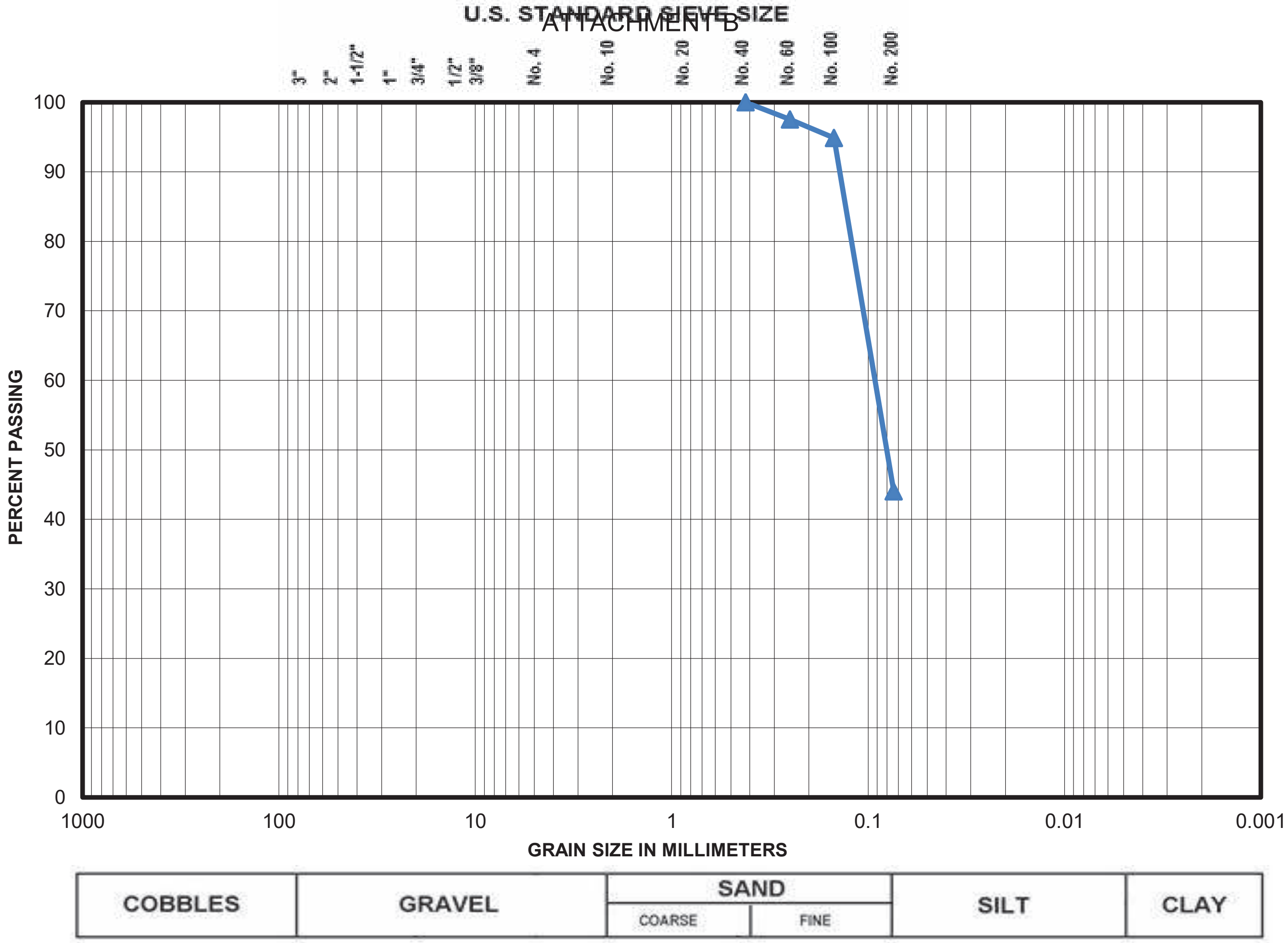
ATTACHMENT B

Laboratory Test Results

33	98.0 - 100.0	Very stiff tan and gray clay with calcareous nodules (CH)	22	118.1	96.4		3.24	15		Yield	UC	
33	108.0 - 110.0	Soft tan sandy clay with sand lenses (CL)	22	129.4	106.3		0.46	15	6.28	Yield	UU	
33	118.0 - 120.0	Stiff tan and gray clay (CH)	35	115.4	85.4		0.44	2		SLS (60°)	UC Remold	
							1.36	9		Multiple Shear		

Disclaimer: The results presented relate only to those samples tested. **Soil Description:** ASTM(D2487) AASHTO(M145) **Moisture Content:**

ATTACHMENT B



Gravel %	0.0	**Fine Sand %**	56.0		
Coarse Sand %	#N/A	**Fines (Silt & Clay) %**	44.0		
USC Classification	SC-SM	C_U	na	C_C	na
Description	Very dense tan and light gray silty sand (SM)				

Individual Sieve Data - % Passing			
3"	#N/A	**No. 4**	#N/A
2"	#N/A	**No. 10**	#N/A
1 1/2"	#N/A	**No. 20**	#N/A
1"	#N/A	**No. 40**	100.0
3/4"	#N/A	**No. 60**	97.6
1/2"	#N/A	**No. 100**	94.9
3/8"	#N/A	**No. 200**	44.0

Project	City of Baton Rouge - Picardy to Perk	**Date Tested**	9/25/2013
Project No.	16710-051-00	**Tested By**	SEF
Boring No.	11	**Checked By**	SLC
Source/Depth (feet)	108.5 - 110	**Sieve Type**	Dry Sieve

NOTE: Test was performed in general accordance with the referenced test method. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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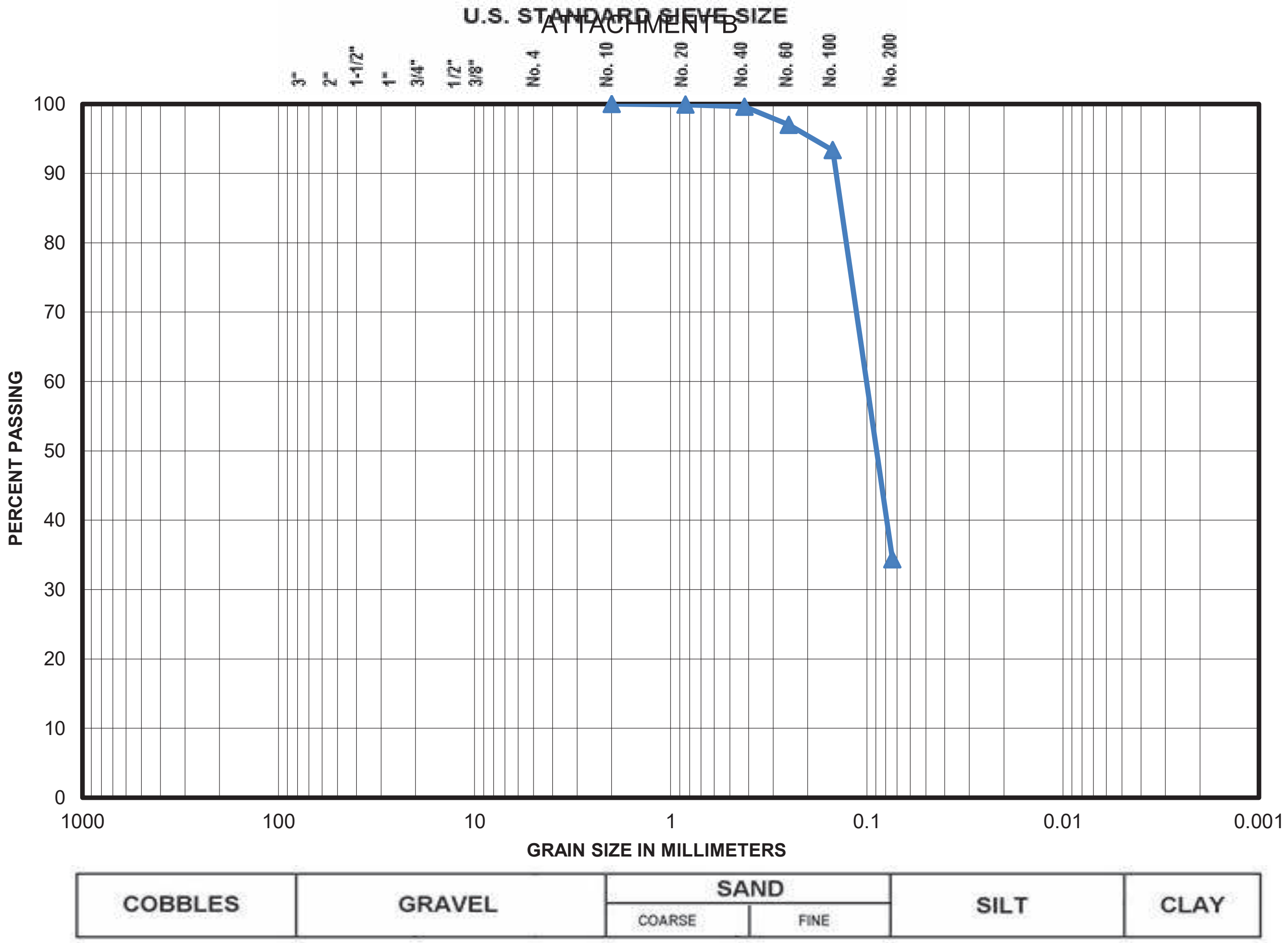
AASHTO T 27 SIEVE ANALYSIS OF FINE & COARSE AGGREGATES

City of Baton Rouge - Picardy to Perkins Connector

16710-051-00

ATTACHMENT B



Gravel %	0.0	**Fine Sand %**		65.2	
Coarse Sand %	0.4	**Fines (Silt & Clay) %**		34.4	
USC Classification	SC	**C_U**	na	**C_C**	na
Description	Clayey sand				

Individual Sieve Data - % Passing			
3"	#N/A	**No. 4**	#N/A
2"	#N/A	**No. 10**	100.0
1 1/2"	#N/A	**No. 20**	99.9
1"	#N/A	**No. 40**	99.6
3/4"	#N/A	**No. 60**	97.0
1/2"	#N/A	**No. 100**	93.3
3/8"	#N/A	**No. 200**	34.4

Project	City of Baton Rouge - Picardy to Perk	**Date Tested**	9/20/2013
Project No.	16710-051-00	**Tested By**	TC
Boring No.	20	**Checked By**	TC
Source/Depth (feet)	118 - 120	**Sieve Type**	Dry Sieve

NOTE: Test was performed in general accordance with the referenced test method. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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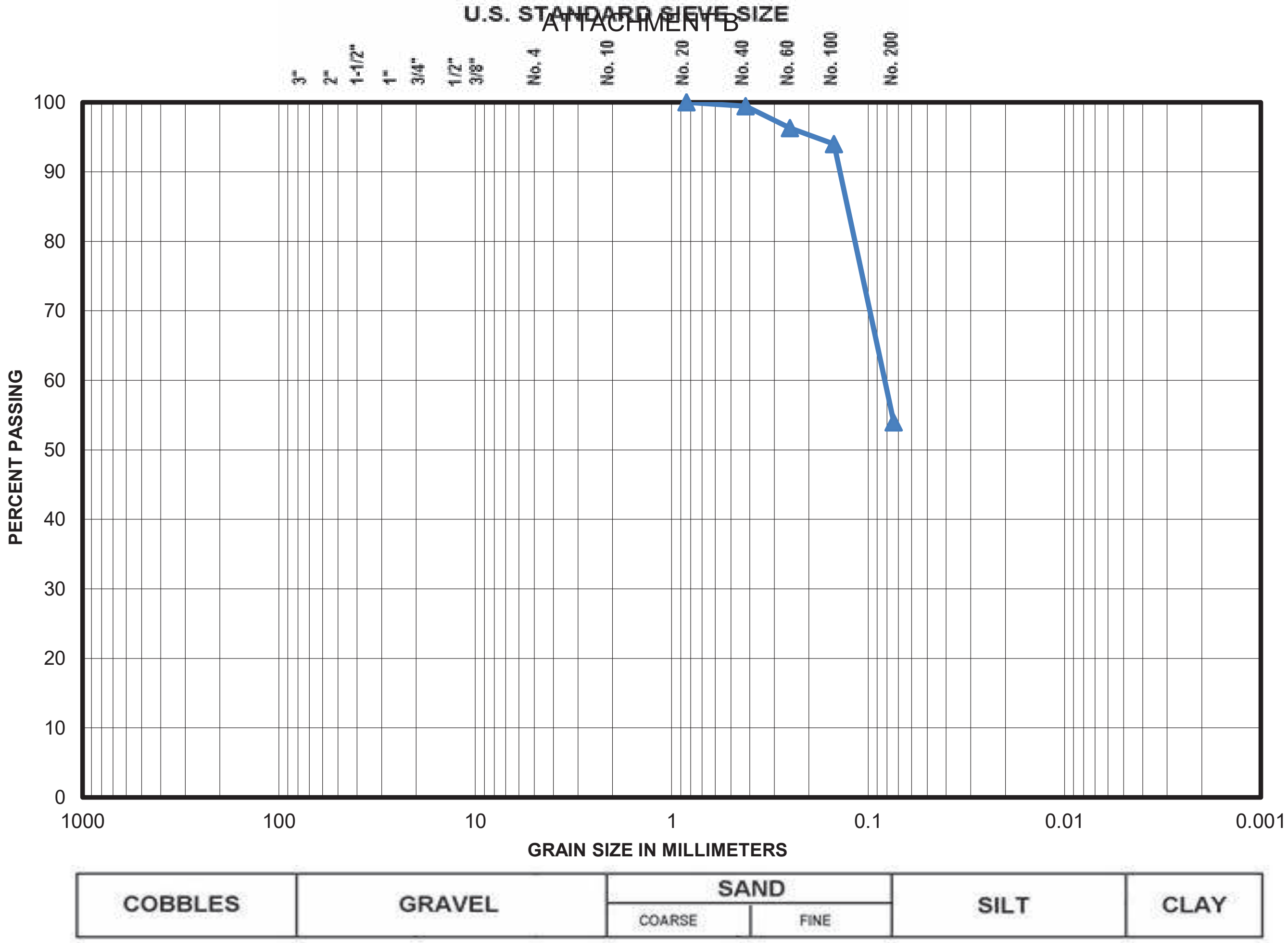
AASHTO T 27 SIEVE ANALYSIS OF FINE & COARSE AGGREGATES

City of Baton Rouge - Picardy to Perkins Connector

16710-051-00

ATTACHMENT B



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<tr><td>Gravel %</td><td>0.0</td><td colspan="2">Fine Sand %</td><td colspan="2">45.5</td></tr>
<tr><td>Coarse Sand %</td><td>#N/A</td><td colspan="2">Fines (Silt & Clay) %</td><td colspan="2">54.0</td></tr>
<tr><td>USC Classification</td><td>SC-SM</td><td>C_U</td><td>na</td><td>C_C</td><td>na</td></tr>
<tr><td>Description</td><td colspan="5">Very dense light gray clayey silty sand (SC-SM)</td></tr>
</table>

Individual Sieve Data - % Passing

3"	#N/A	**No. 4**	#N/A
2"	#N/A	**No. 10**	#N/A
1 1/2"	#N/A	**No. 20**	100.0
1"	#N/A	**No. 40**	99.5
3/4"	#N/A	**No. 60**	96.3
1/2"	#N/A	**No. 100**	94.0
3/8"	#N/A	**No. 200**	54.0

Project	City of Baton Rouge - Picardy to Perk	**Date Tested**	9/20/2013
Project No.	16710-051-00	**Tested By**	TC
Boring No.	21	**Checked By**	TC
Source/Depth (feet)	113.5 - 115	**Sieve Type**	Dry Sieve

NOTE: Test was performed in general accordance with the referenced test method. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations or generated by separate operations or processes. This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc.

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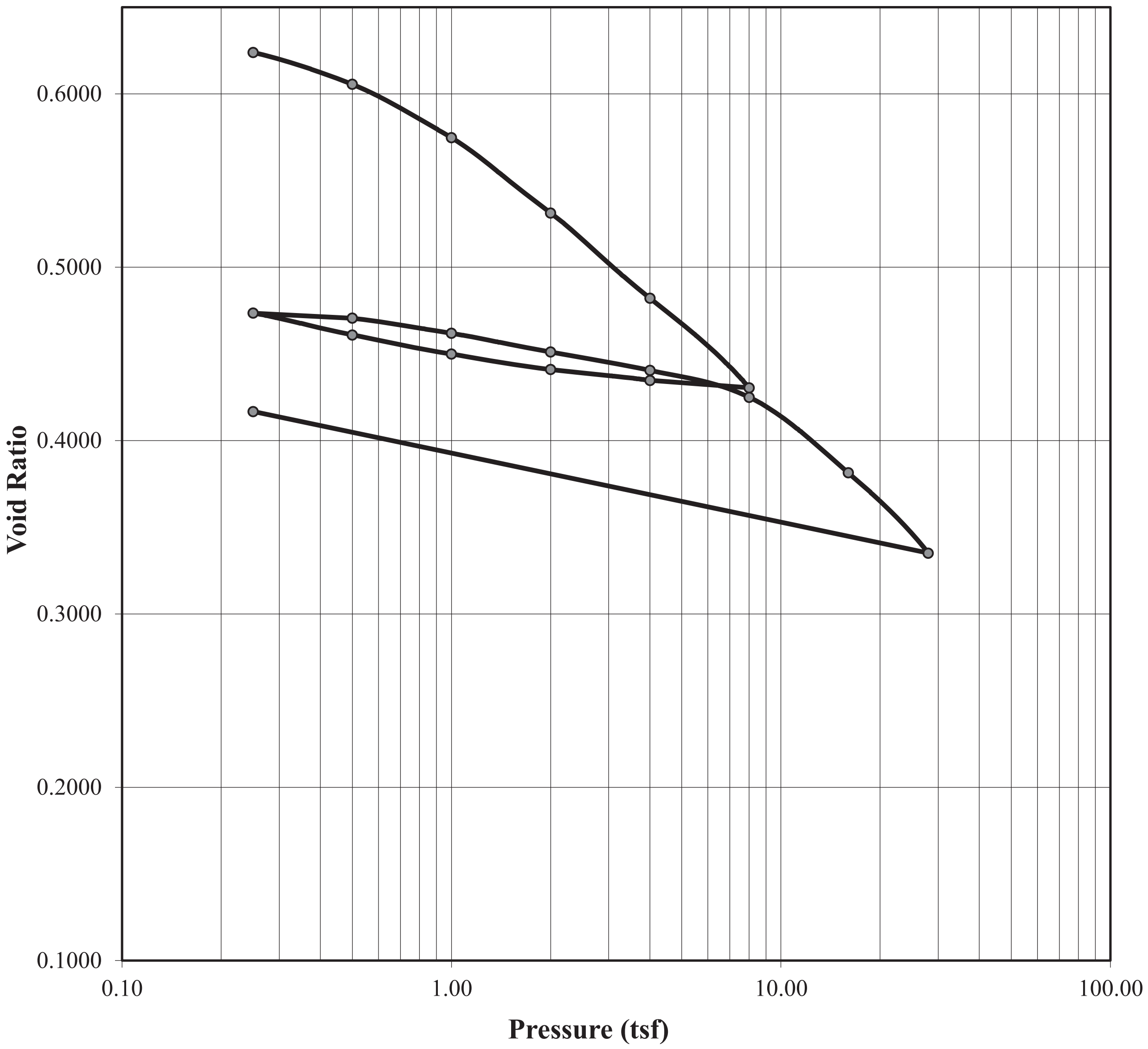
AASHTO T 27 SIEVE ANALYSIS OF FINE & COARSE AGGREGATES

City of Baton Rouge - Picardy to Perkins Connector

16710-051-00

Consolidation Test
Test Results



	Before	After				
	Before	**After**	**Liquid Limits:**	42	**Test Date:**	24 Sep 2013
Moisture (%):	24.84	19.83	**Plastic Limits:**	22		
Dry Density (pcf):	100.37	114.49	**Plasticity Index (%):**	20		
Saturation (%):	101.55	118.10				
Void Ratio:	0.6457	0.4170	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 4 - 6 feet

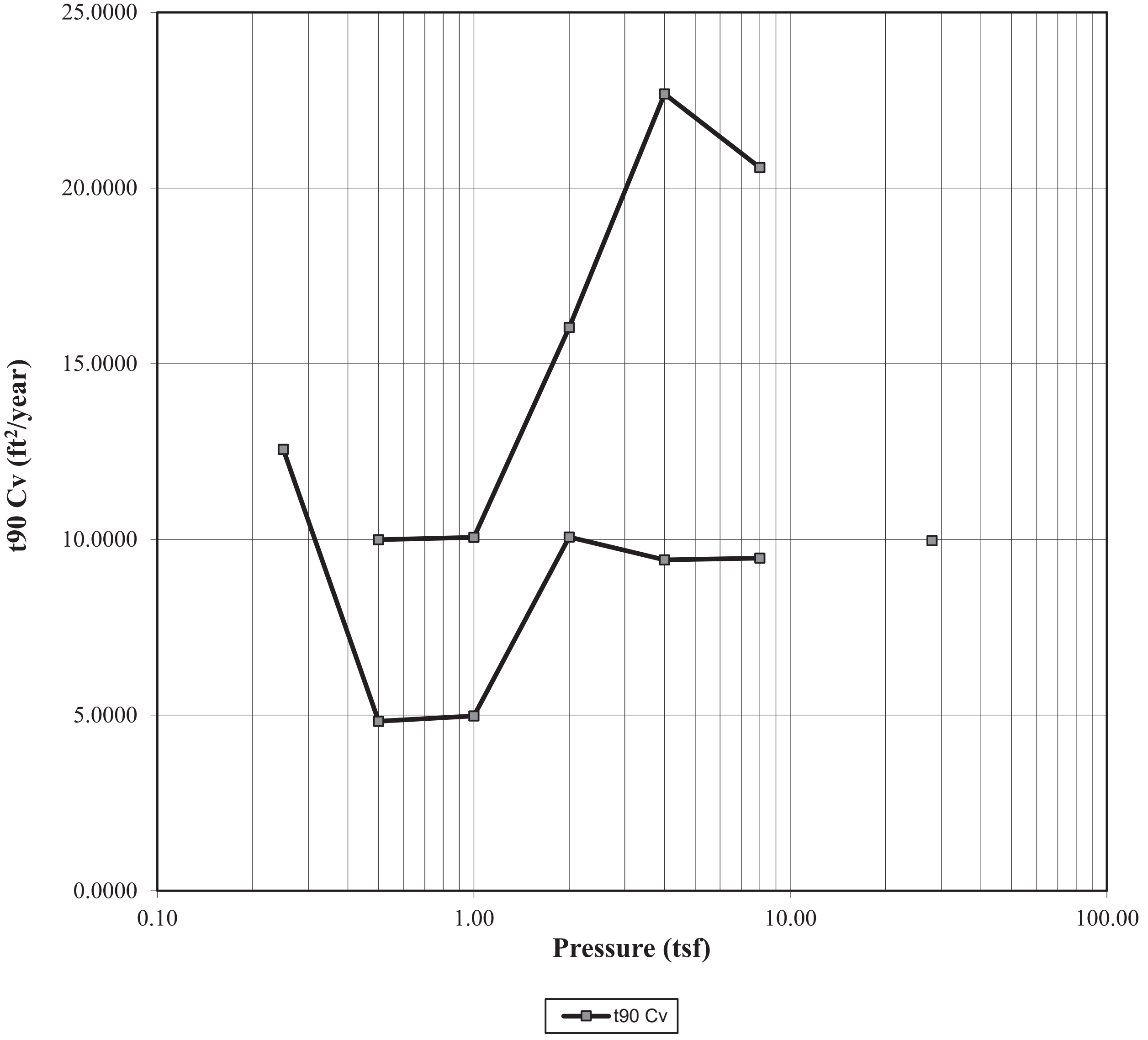
Sample Number: **Boring Number:** 11

Remarks:

Project: Perkins to Picardy Connector
Client: EBR City-Parish/Evans-Graves
Location: Baton Rouge, LA

Consolidation Test

Test Results



	Before	After				
Moisture (%):	24.84	19.83	**Liquid Limits:**	42	**Test Date:**	24 Sep 2013
Dry Density (pcf):	100.37	114.49	**Plastic Limits:**	22		
Saturation (%):	101.55	118.10	**Plasticity Index (%):**	20		
Void Ratio:	0.6457	0.4170	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 4 - 6 feet

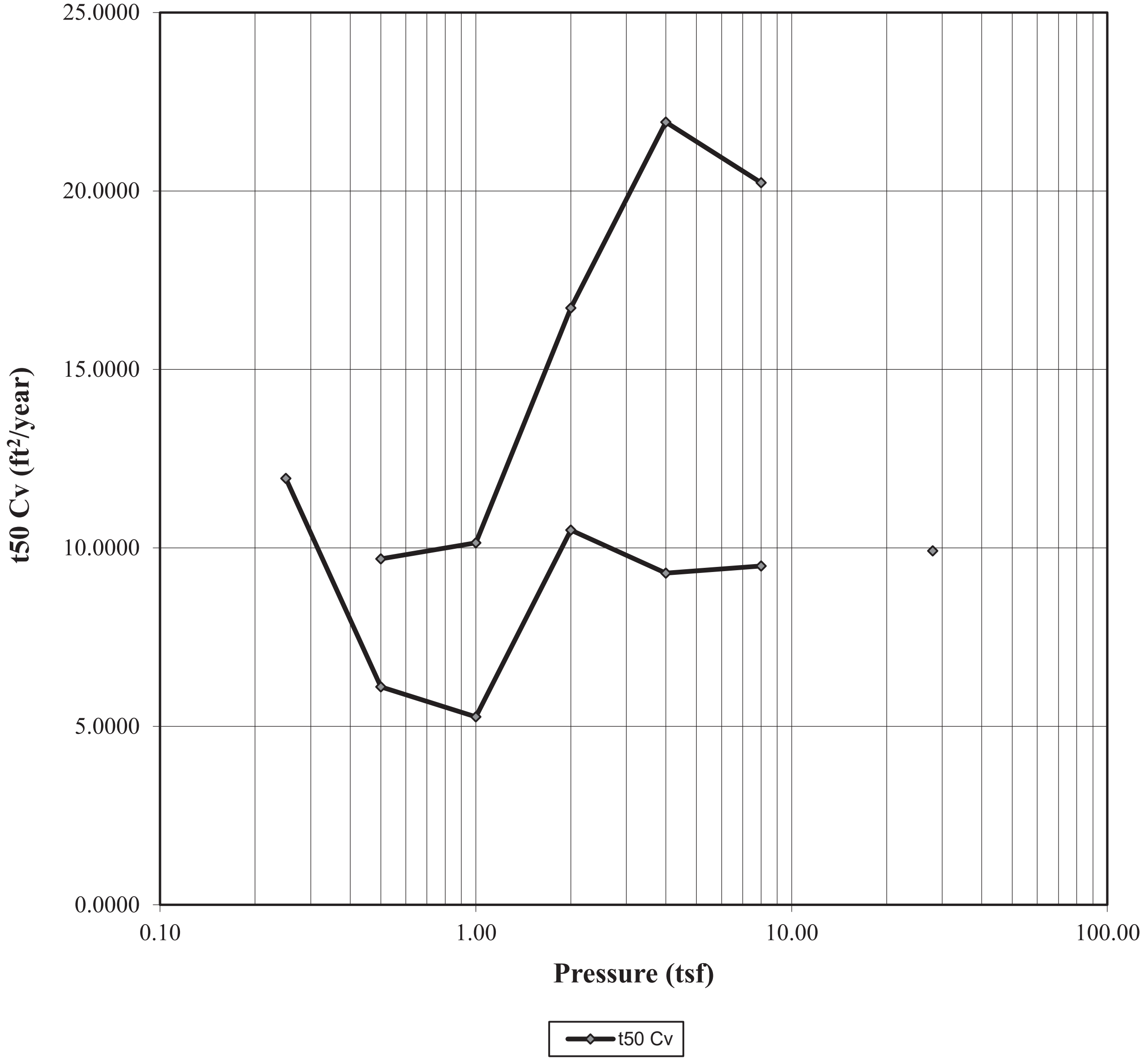
Sample Number: **Boring Number:** 11

Remarks:

Project: Perkins to Picardy Connector
Client: EBR City-Parish/Evans-Graves
Location: Baton Rouge, LA

Consolidation Test

Test Results



	Before	After				
Moisture (%):	24.84	19.83	**Liquid Limits:**	42	**Test Date:**	24 Sep 2013
Dry Density (pcf):	100.37	114.49	**Plastic Limits:**	22		
Saturation (%):	101.55	118.10	**Plasticity Index (%):**	20		
Void Ratio:	0.6457	0.4170	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 4 - 6 feet

Sample Number: **Boring Number:** 11

Remarks:

Project: Perkins to Picardy Connector
Client: EBR City-Parish/Evans-Graves
Location: Baton Rouge, LA

ATTACHMENT B

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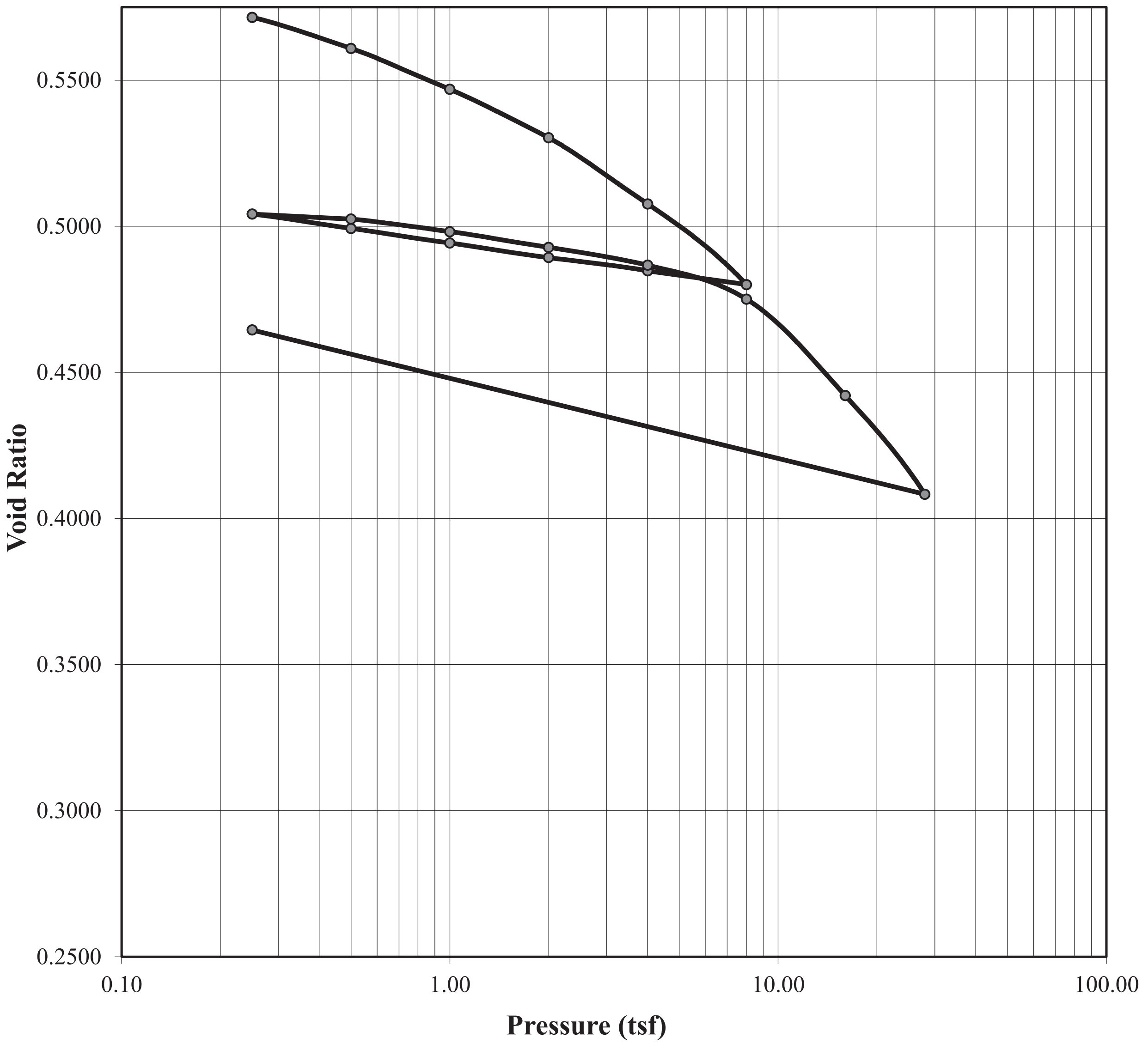
Consolidation Test

Test Results



	Before	**After**	**Liquid Limits:**	27	**Test Date:**	24 Sep 2013
Moisture (%):	24.10	20.10	**Plastic Limits:**	20		
Dry Density (pcf):	104.20	112.31	**Plasticity Index (%):**	7		
Saturation (%):	108.67	112.62				
Void Ratio:	0.5866	0.4661	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clayey Silt (CL-ML)

Project Number: 16710-051-00 **Depth:** 23 - 25 feet

Sample Number: **Boring Number:** 11

Project: Perkins to Picardy Connector

Client: EBR City-Parish/Evans-Graves

Location: Baton Rouge, LA

Remarks:

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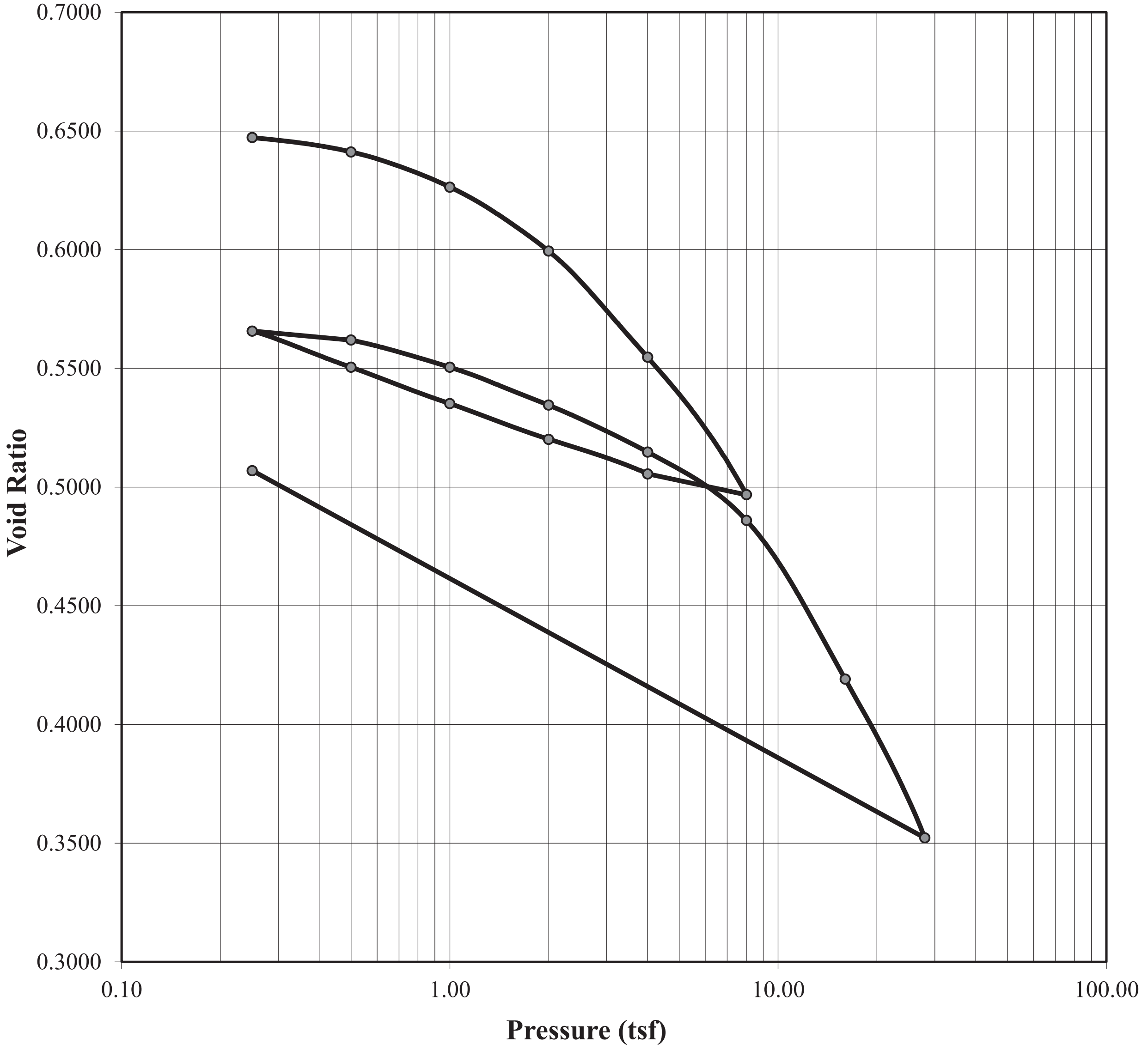
Consolidation Test

Test Results



	Before	After	Liquid Limits:	47	Test Date:	17 Feb 2014
Moisture (%):	24.02	22.56	**Plastic Limits:**	17		
Dry Density (pcf):	100.07	105.53	**Plasticity Index (%):**	25		
Saturation (%):	97.46	105.33				
Void Ratio:	0.6519	0.5085	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 48 - 50 feet

Sample Number: **Boring Number:** 28

Remarks:

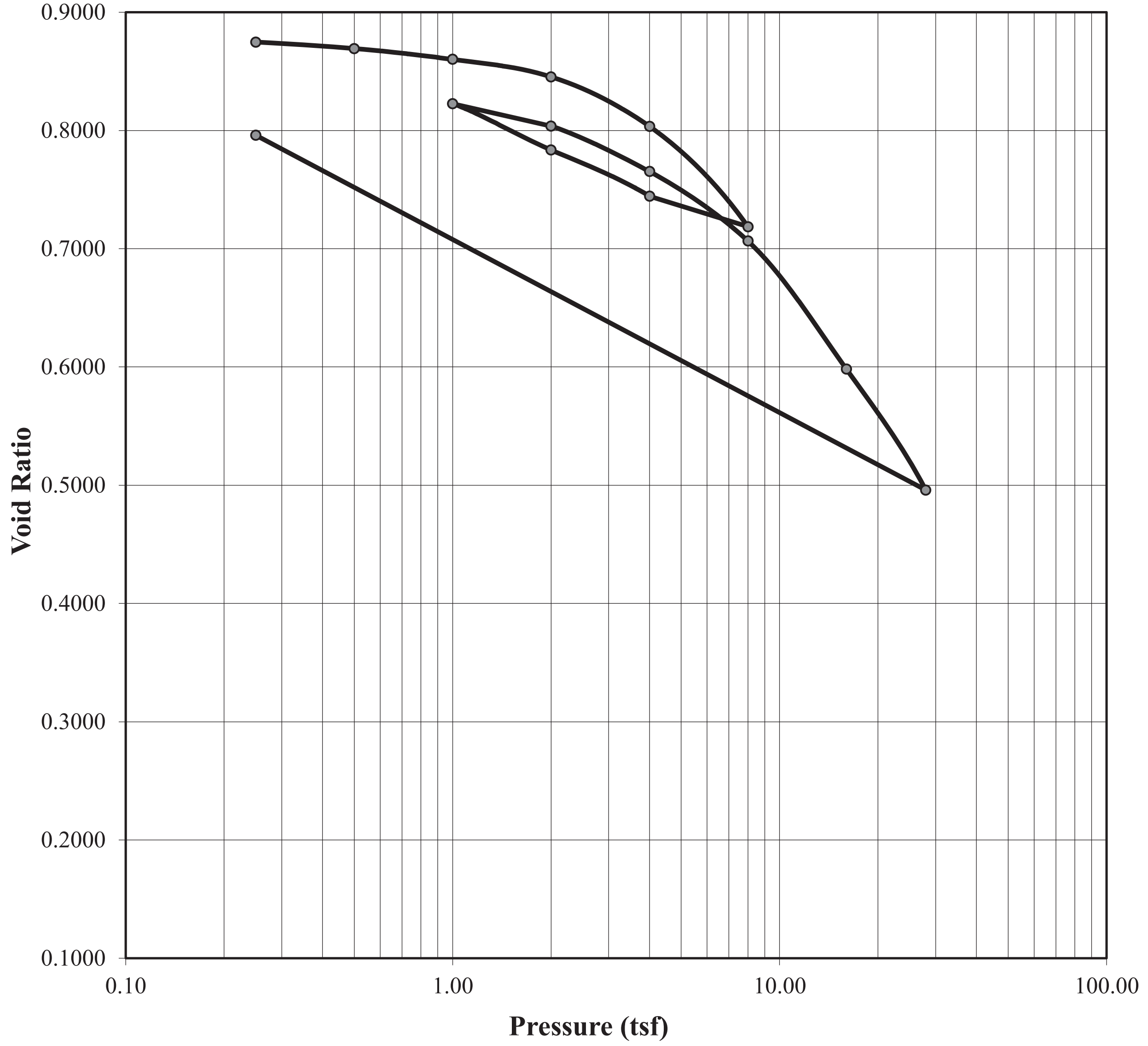
Project: Perkins to Picardy Connector

Client: City of Baton Rouge, Parish of EBR, Evans-Graves

Location: East Baton Rouge Parish, LA

Consolidation Test

Test Results



	Before	After				
	Before	**After**	**Liquid Limits:**	88	**Test Date:**	17 Feb 2014
Moisture (%):	34.01	35.95	**Plastic Limits:**	27		
Dry Density (pcf):	87.79	89.33	**Plasticity Index (%):**	61		
Saturation (%):	101.90	111.81				
Void Ratio:	0.8815	0.7964	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay (CH)

Project Number: 16710-051-00 **Depth:** 33 - 35 feet

Sample Number: **Boring Number:** 29

Remarks:

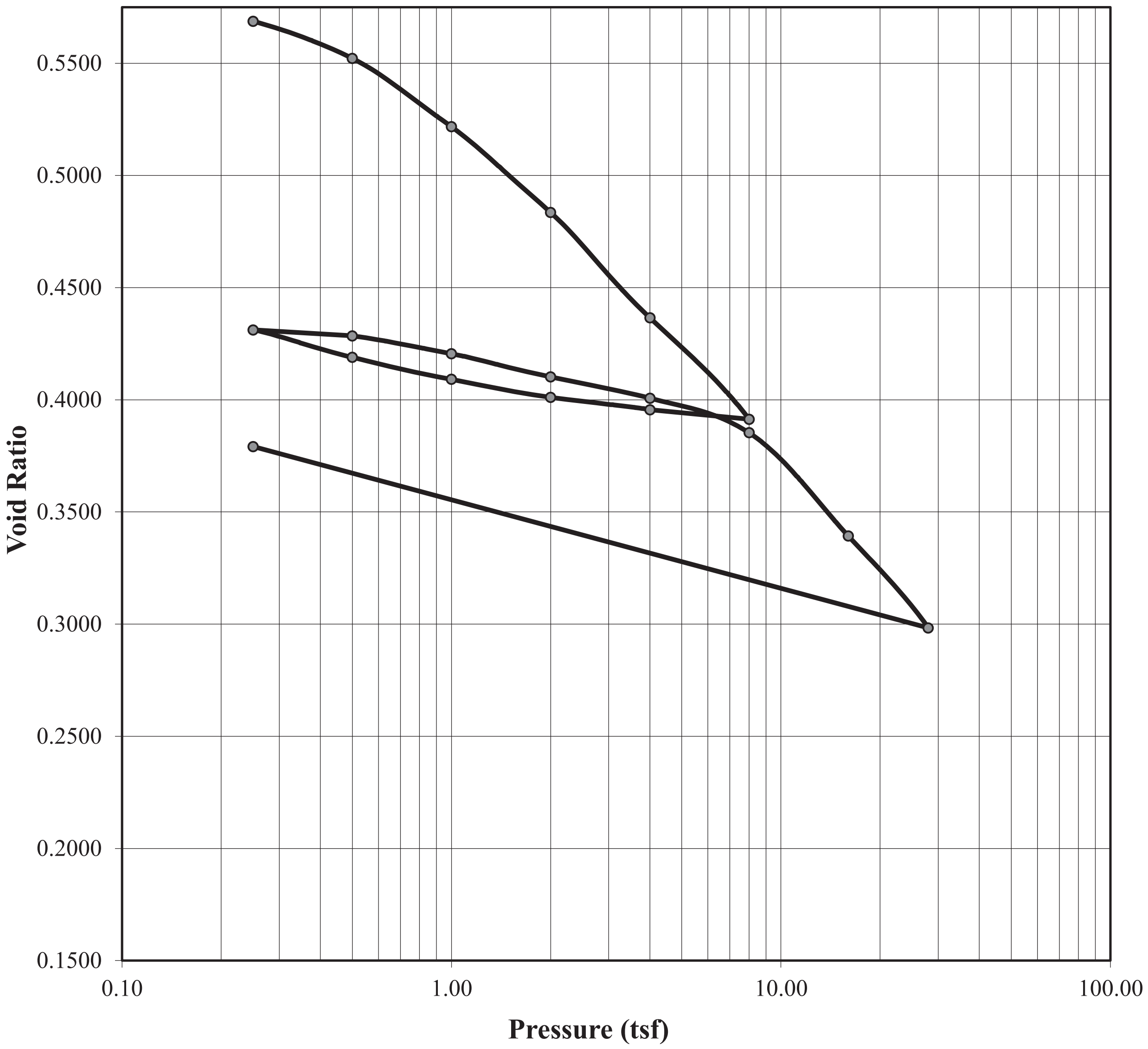
Project: Perkins to Picardy Connector

Client: City of Baton Rouge, Parish of EBR, Evans-Graves

Location: East Baton Rouge Parish, LA

Consolidation Test

Test Results



	Before	After				
Moisture (%):	23.39	20.09	**Liquid Limits:**	37	**Test Date:**	23 Sep 2013
Dry Density (pcf):	100.84	118.15	**Plastic Limits:**	17		
Saturation (%):	96.76	133.02	**Plasticity Index (%):**	20		
Void Ratio:	0.6379	0.3793	**Specific Gravity:**	2.650	Assumed	

Soil Description: Silty Clay (CL)

Project Number: 16710-051-00 **Depth:** 13 - 15 feet

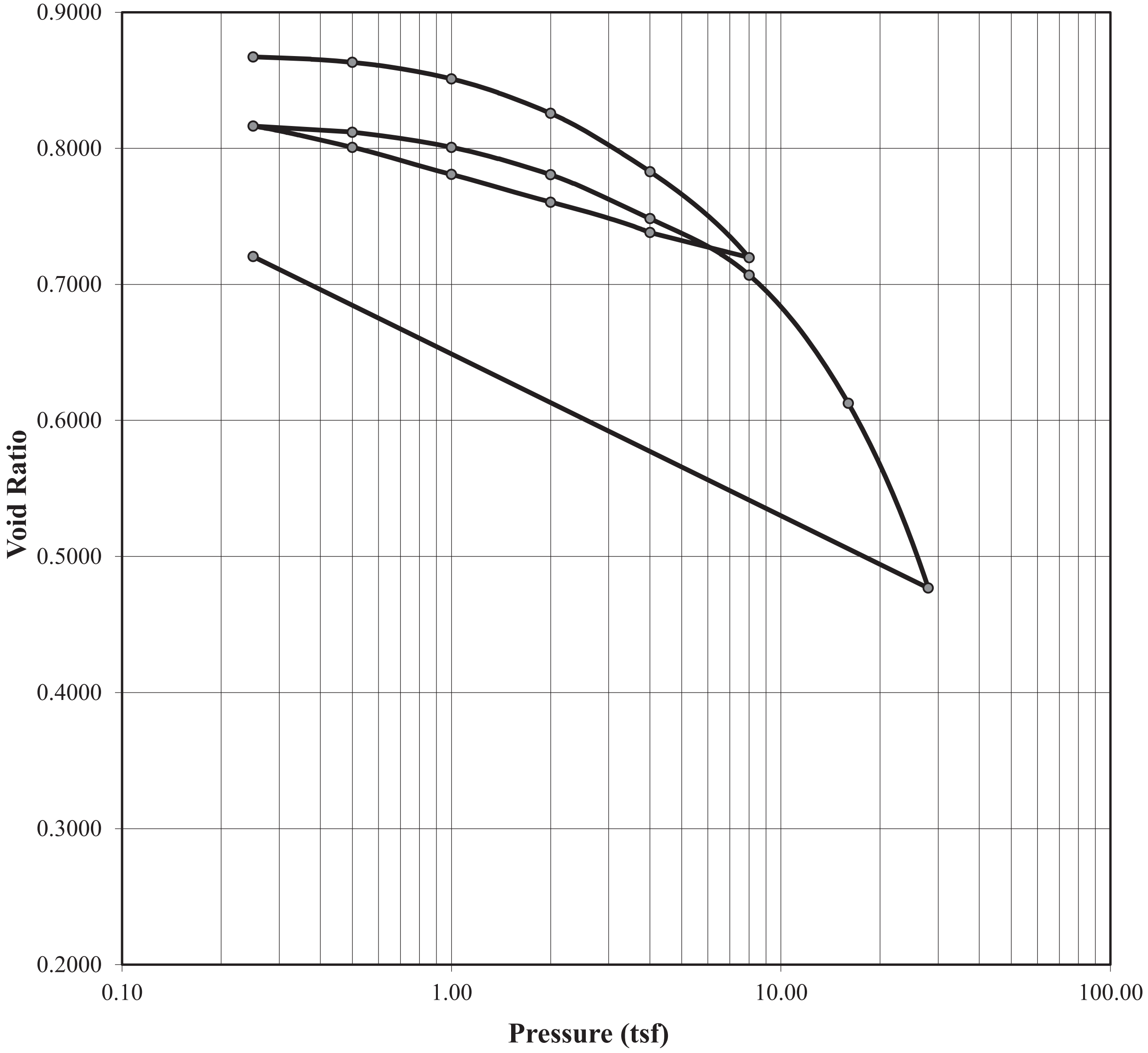
Sample Number: **Boring Number:** 31

Remarks:

Project: Perkins to Picardy Connector
Client: EBR City-Parish/Evans-Graves
Location: Baton Rouge, LA

Consolidation Test

Test Results

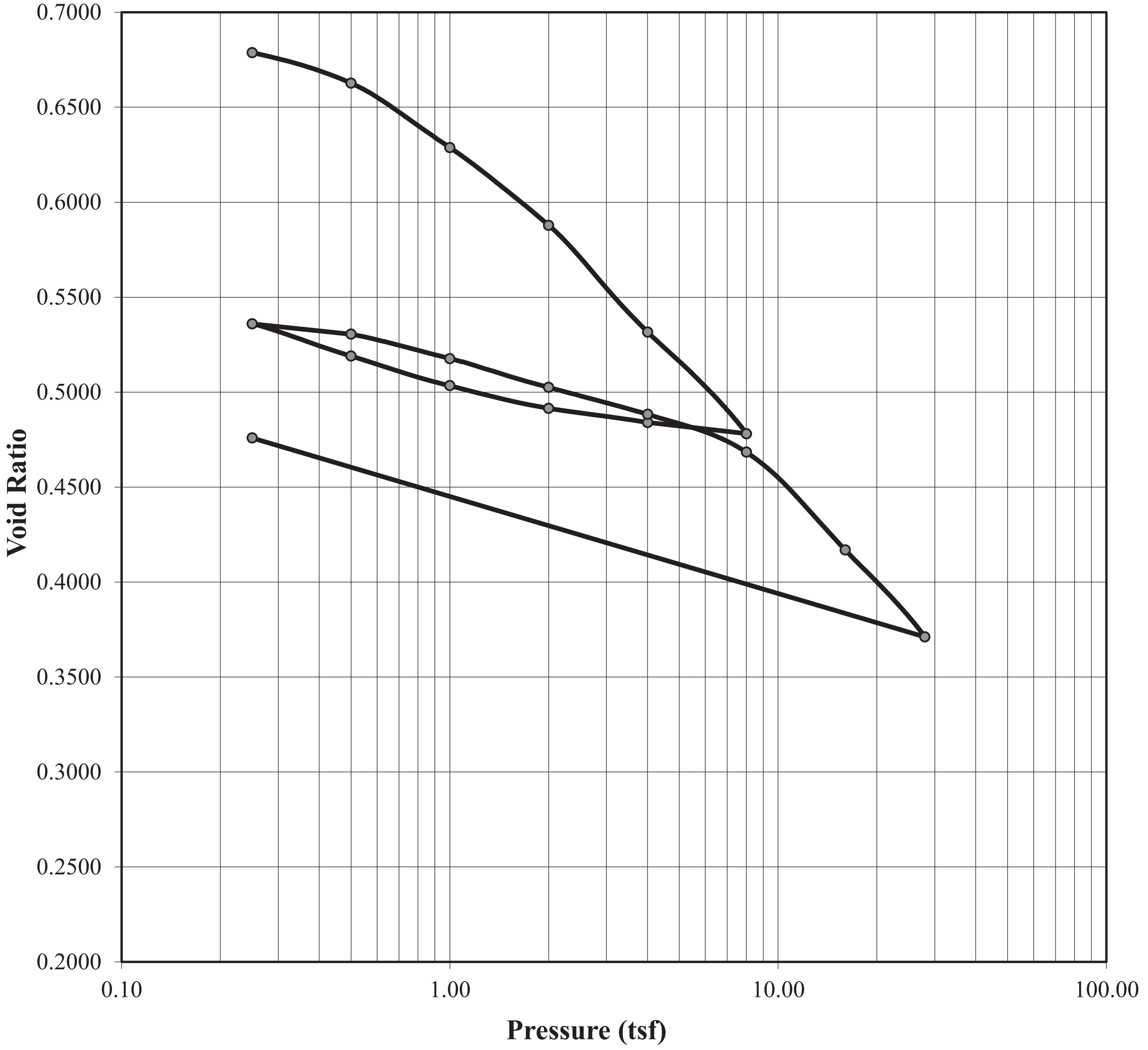


	Before	After	**Liquid Limits:**	95	**Test Date:**	23 Sep 2013
Moisture (%):	35.46	34.64	**Plastic Limits:**	30		
Dry Density (pcf):	88.06	91.84	**Plasticity Index (%):**	65		
Saturation (%):	106.95	114.55				
Void Ratio:	0.8766	0.7217	**Specific Gravity:**	2.650	Assumed	

Soil Description:	Clay (CH)		
Project Number:	16710-051-00	**Depth:** 38 - 40 feet	**Remarks:**
Sample Number:		**Boring Number:** 31	
Project:	Perkins to Picardy Connector		
Client:	EBR City-Parish/Evans-Graves		
Location:	Baton Rouge, LA		

Consolidation Test

Test Results



	Before	After	Liquid Limits:	44	Test Date:	17 Feb 2014
Moisture (%):	25.74	21.23	**Plastic Limits:**	19		
Dry Density (pcf):	98.15	110.70	**Plasticity Index (%):**	25		
Saturation (%):	99.50	113.77				
Void Ratio:	0.6836	0.4768	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

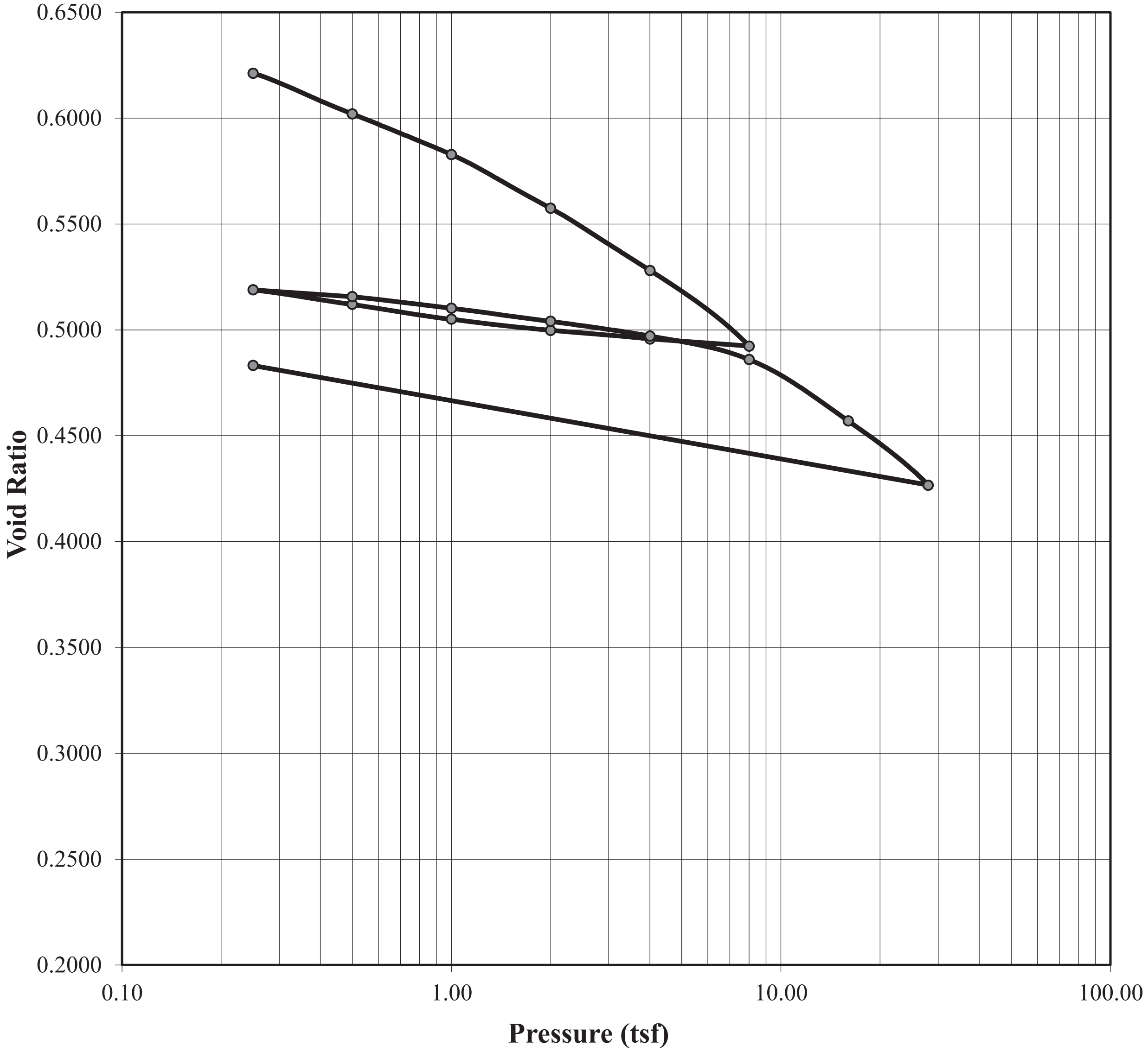
Project Number: 16710-051-00 **Depth:** 18 - 20 feet

Sample Number: **Boring Number:** 33

Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

Consolidation Test
Test Results



	Before	After				
	Before	**After**	**Liquid Limits:**	34	**Test Date:**	17 Feb 2014
Moisture (%):	23.83	18.72	**Plastic Limits:**	16		
Dry Density (pcf):	100.78	111.19	**Plasticity Index (%):**	18		
Saturation (%):	98.45	101.68				
Void Ratio:	0.6396	0.4842	**Specific Gravity:**	2.650	Assumed	

Soil Description: Silty Clay (CL)

Project Number: 16710-051-00 **Depth:** 28 - 30 feet

Sample Number: **Boring Number:** 33

Remarks:

Project: Perkins to Picardy Connector

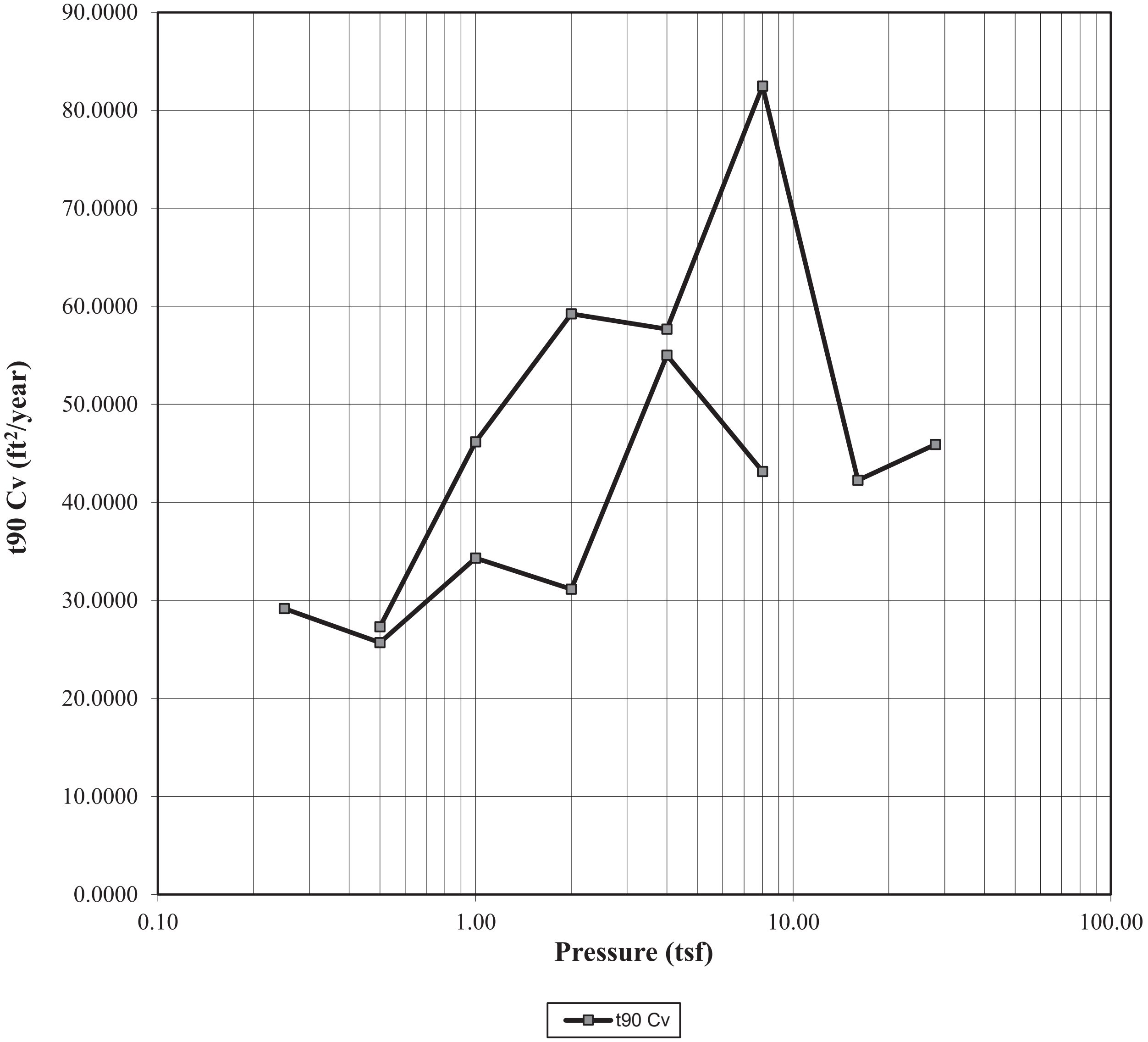
Client: City of Baton Rouge, Parish of EBR, Evans-Graves

Location: East Baton Rouge Parish, LA

ATTACHMENT B

GEOENGINEERS

Consolidation Test
Test Results



	Before	After	Liquid Limits:	34	Test Date:	17 Feb 2014
Moisture (%):	23.83	18.72	**Plastic Limits:**	16		
Dry Density (pcf):	100.78	111.19	**Plasticity Index (%):**	18		
Saturation (%):	98.45	101.68				
Void Ratio:	0.6396	0.4842	**Specific Gravity:**	2.650	Assumed	

Soil Description: Silty Clay (CL)

Project Number: 16710-051-00 **Depth:** 28 - 30 feet

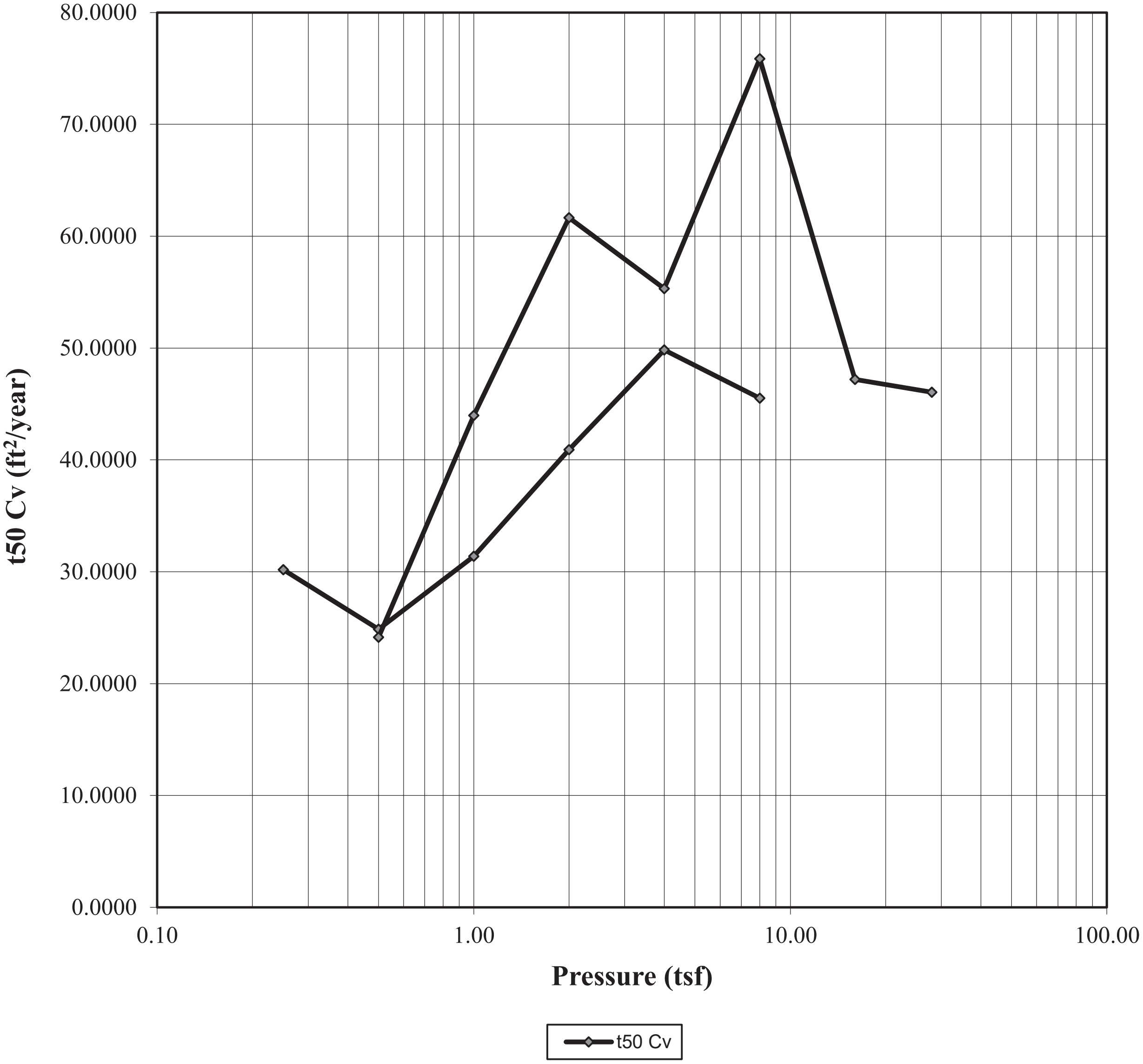
Sample Number: **Boring Number:** 33

Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

Consolidation Test

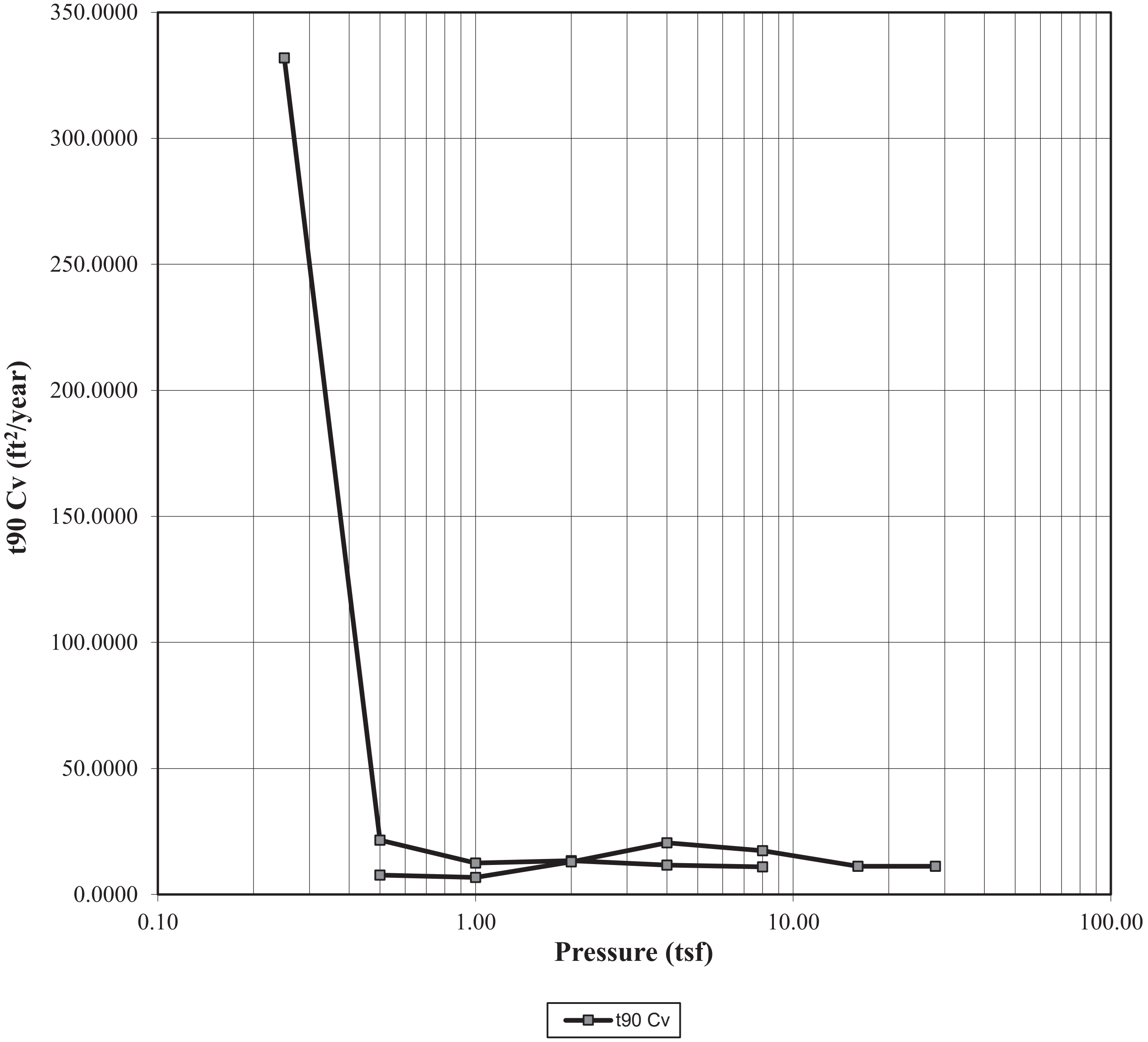
Test Results



	Before	After	**Liquid Limits:**	34	**Test Date:**	17 Feb 2014
Moisture (%):	23.83	18.72	**Plastic Limits:**	16		
Dry Density (pcf):	100.78	111.19	**Plasticity Index (%):**	18		
Saturation (%):	98.45	101.68				
Void Ratio:	0.6396	0.4842	**Specific Gravity:**	2.650	Assumed	

Soil Description:	Silty Clay (CL)		
Project Number:	16710-051-00	**Depth:** 28 - 30 feet	**Remarks:**
Sample Number:		**Boring Number:** 33	
Project:	Perkins to Picardy Connector		
Client:	City of Baton Rouge, Parish of EBR, Evans-Graves		
Location:	East Baton Rouge Parish, LA		

Consolidation Test
Test Results



	Before	After	Liquid Limits:	44	Test Date:	17 Feb 2014
Moisture (%):	25.74	21.23	**Plastic Limits:**	19		
Dry Density (pcf):	98.15	110.70	**Plasticity Index (%):**	25		
Saturation (%):	99.50	113.77				
Void Ratio:	0.6836	0.4768	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 18 - 20 feet

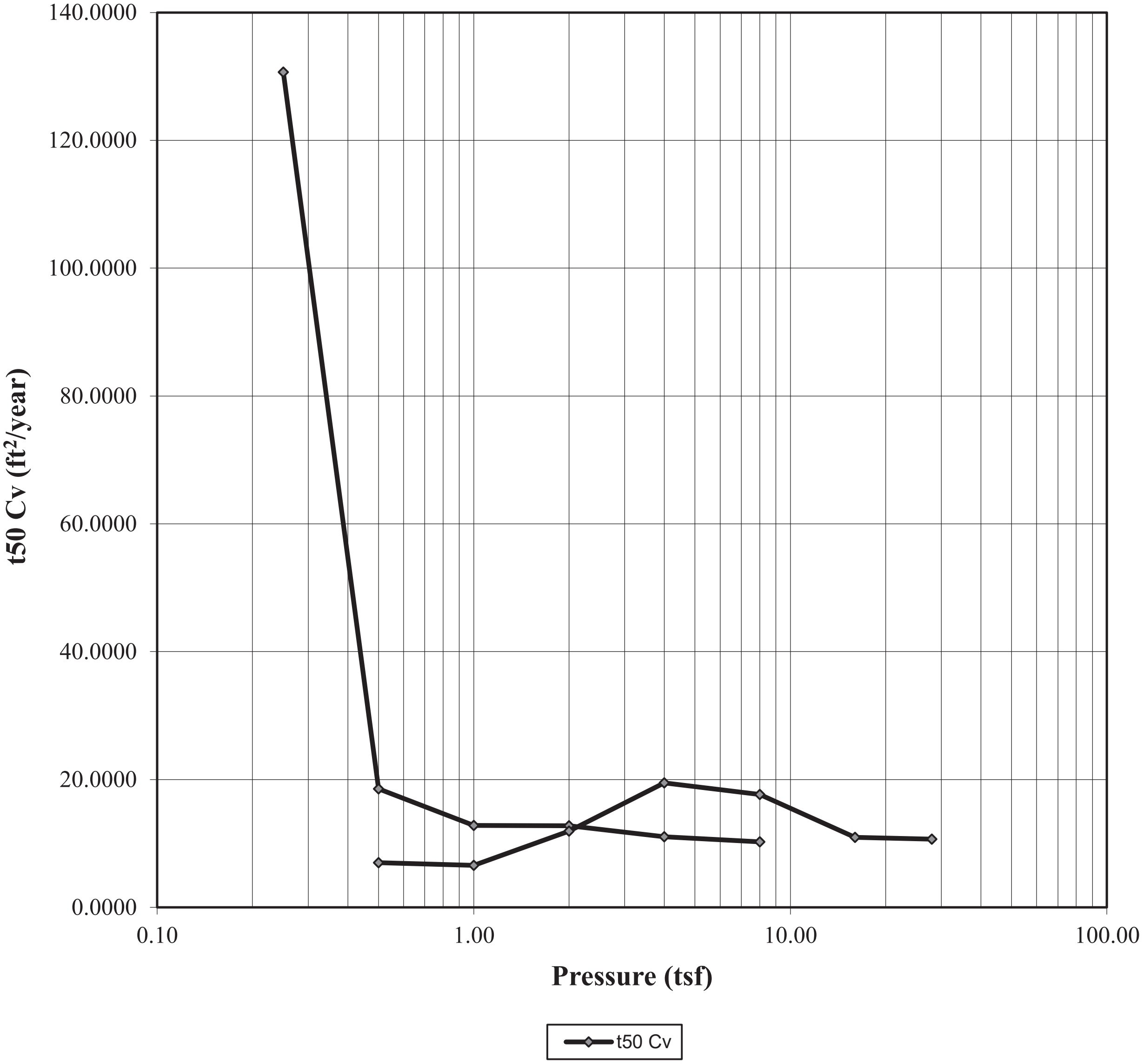
Sample Number: **Boring Number:** 33

Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

Consolidation Test

Test Results



	Before	After	Liquid Limits:	44	Test Date:	17 Feb 2014
Moisture (%):	25.74	21.23	**Plastic Limits:**	19		
Dry Density (pcf):	98.15	110.70	**Plasticity Index (%):**	25		
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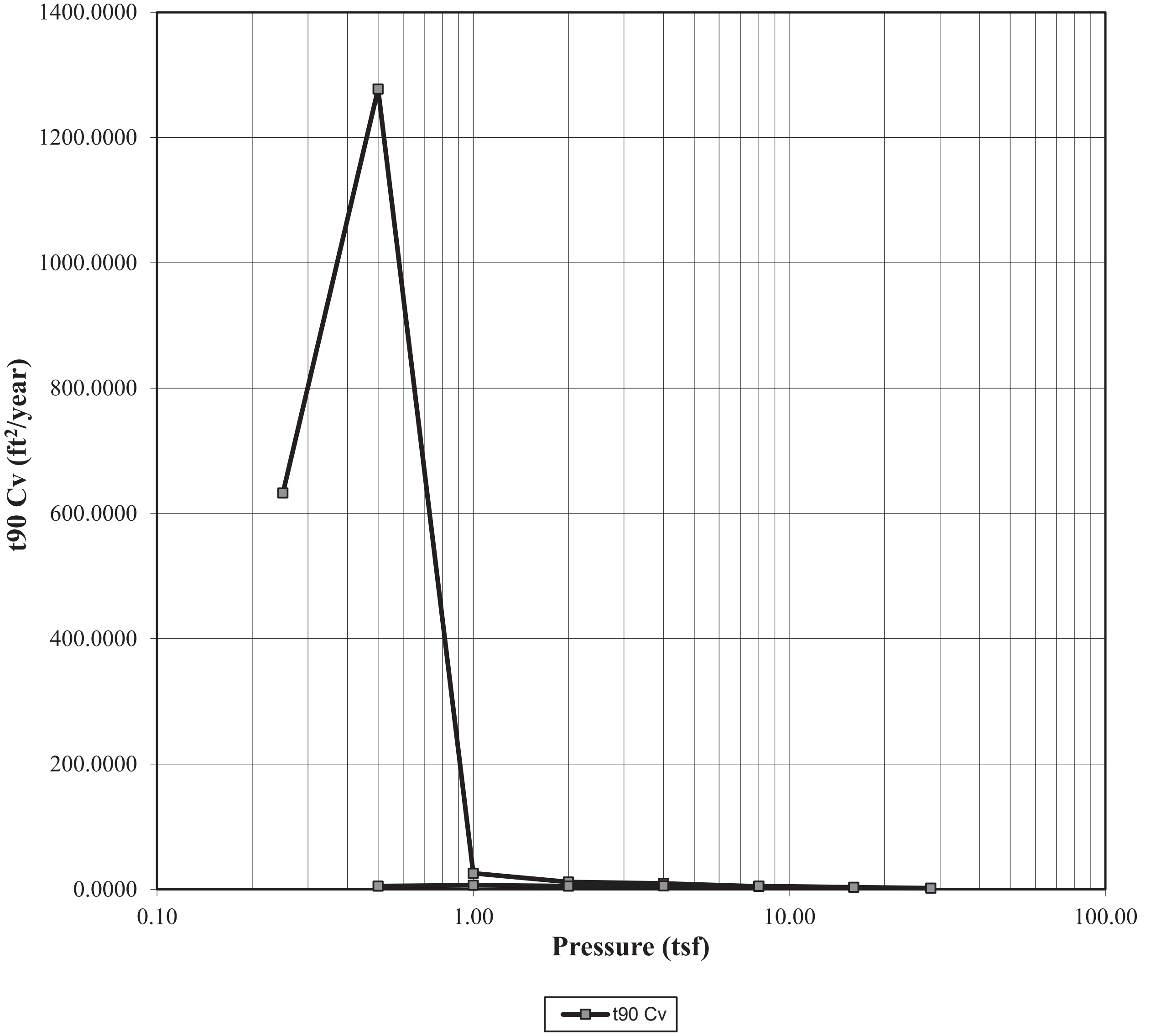
Location: East Baton Rouge Parish, LA

ATTACHMENT B

GEOENGINEERS

Consolidation Test

Test Results



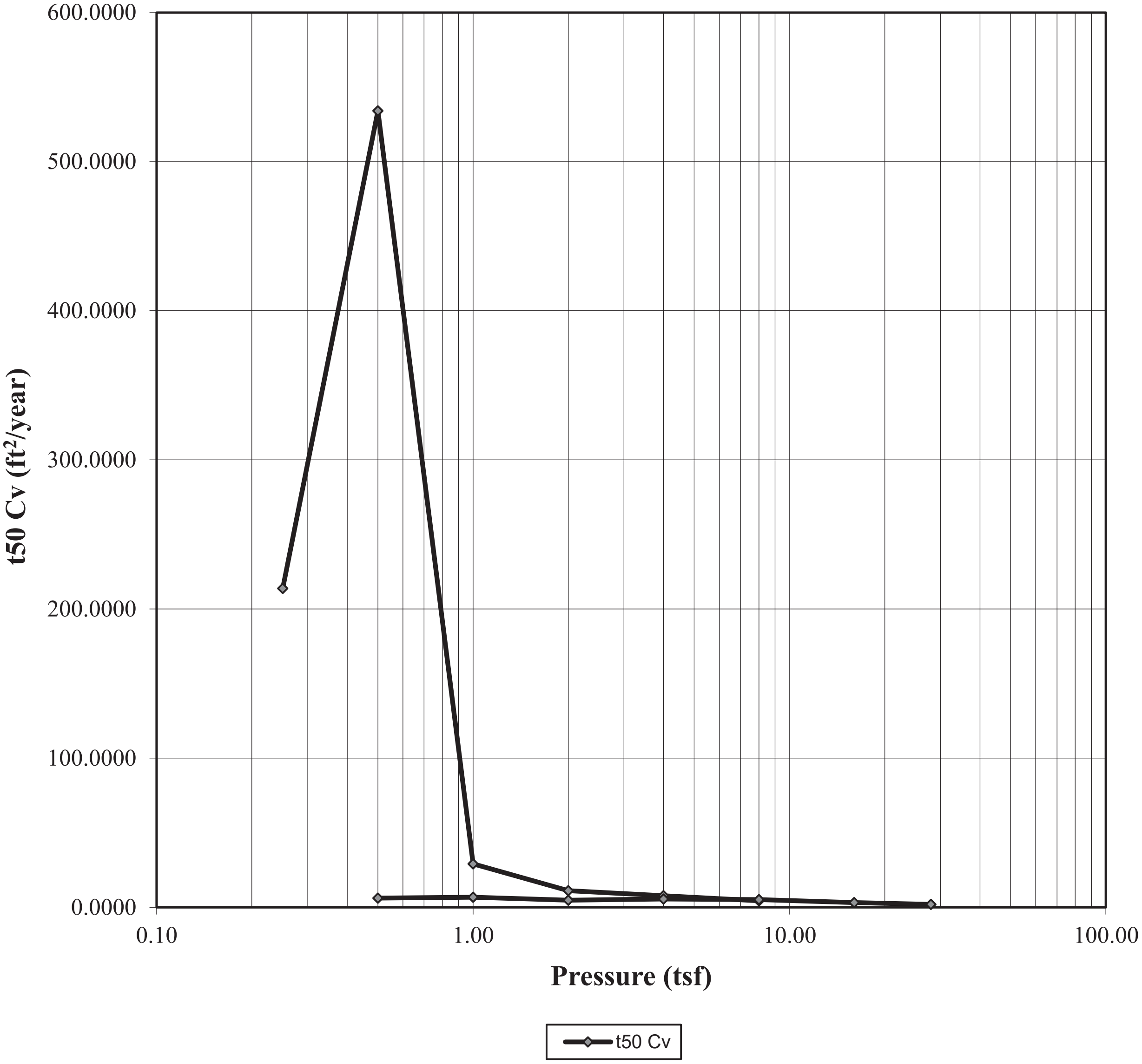
	Before	After	Liquid Limits:	95	Test Date:	23 Sep 2013
Moisture (%):	35.46	34.64	**Plastic Limits:**	30		
Dry Density (pcf):	88.06	91.84	**Plasticity Index (%):**	65		
Saturation (%):	106.95	114.55				
Void Ratio:	0.8766	0.7217	**Specific Gravity:**	2.650	Assumed	

Soil Description:	Clay (CH)		
Project Number:	16710-051-00	**Depth:** 38 - 40 feet	**Remarks:**
Sample Number:		**Boring Number:** 31	
Project:	Perkins to Picardy Connector		
Client:	EBR City-Parish/Evans-Graves		
Location:	Baton Rouge, LA		

ATTACHMENT B

GEOENGINEERS

Consolidation Test
Test Results



	Before	After				
	Before	**After**	**Liquid Limits:**	95	**Test Date:**	23 Sep 2013
Moisture (%):	35.46	34.64	**Plastic Limits:**	30		
Dry Density (pcf):	88.06	91.84	**Plasticity Index (%):**	65		
Saturation (%):	106.95	114.55				
Void Ratio:	0.8766	0.7217	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay (CH)

Project Number: 16710-051-00 **Depth:** 38 - 40 feet

Sample Number: **Boring Number:** 31

Remarks:

Project: Perkins to Picardy Connector

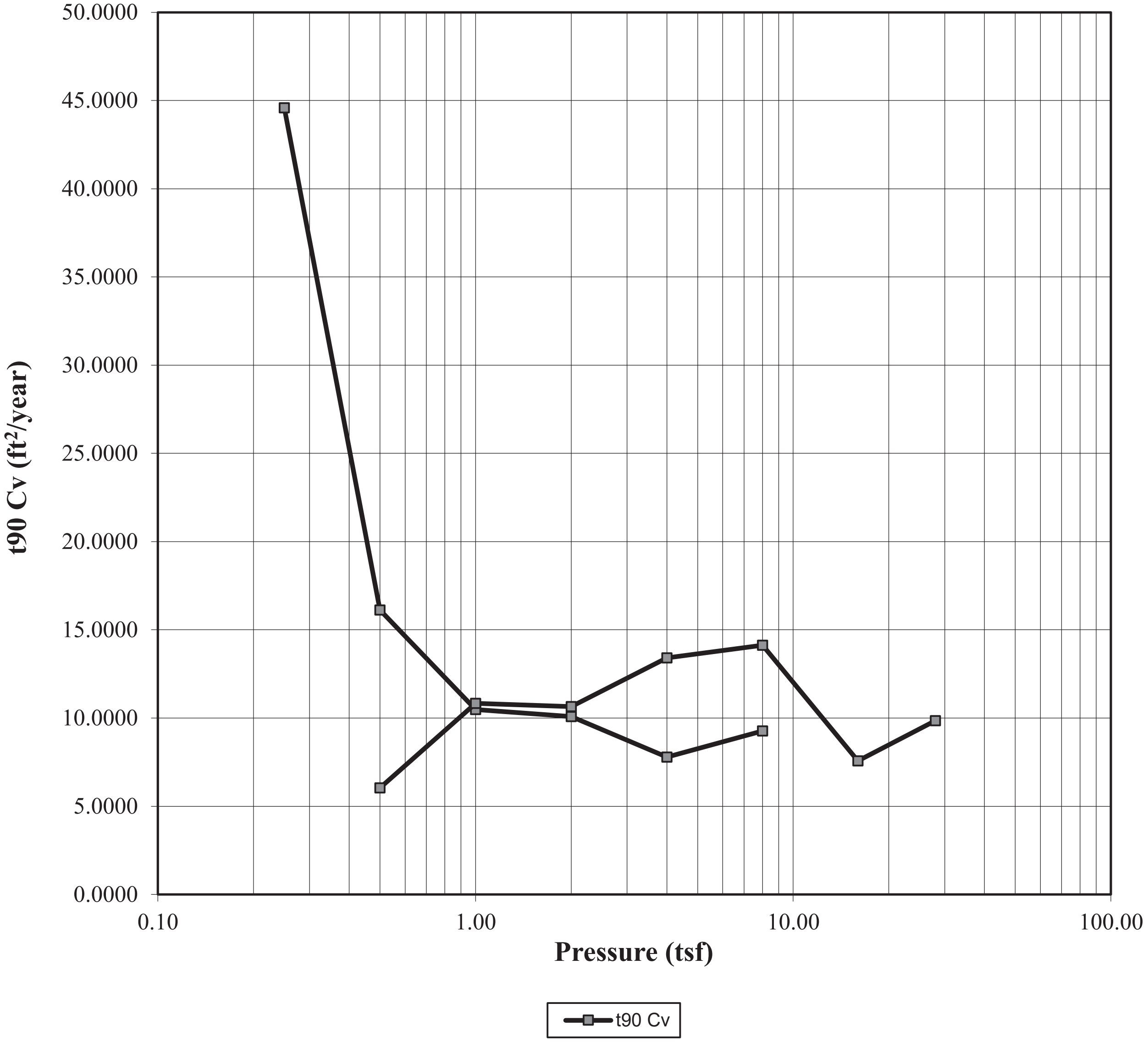
Client: EBR City-Parish/Evans-Graves

Location: Baton Rouge, LA

GEOENGINEERS

Consolidation Test

Test Results



	Before	After	Liquid Limits:	37	Test Date:	23 Sep 2013
Moisture (%):	23.39	20.09	**Plastic Limits:**	17		
Dry Density (pcf):	100.84	118.15	**Plasticity Index (%):**	20		
Saturation (%):	96.76	133.02				
Void Ratio:	0.6379	0.3793	**Specific Gravity:**	2.650	Assumed	

Soil Description: Silty Clay (CL)

Project Number: 16710-051-00 **Depth:** 13 - 15 feet **Remarks:**

Sample Number: **Boring Number:** 31

Project: Perkins to Picardy Connector

Client: EBR City-Parish/Evans-Graves

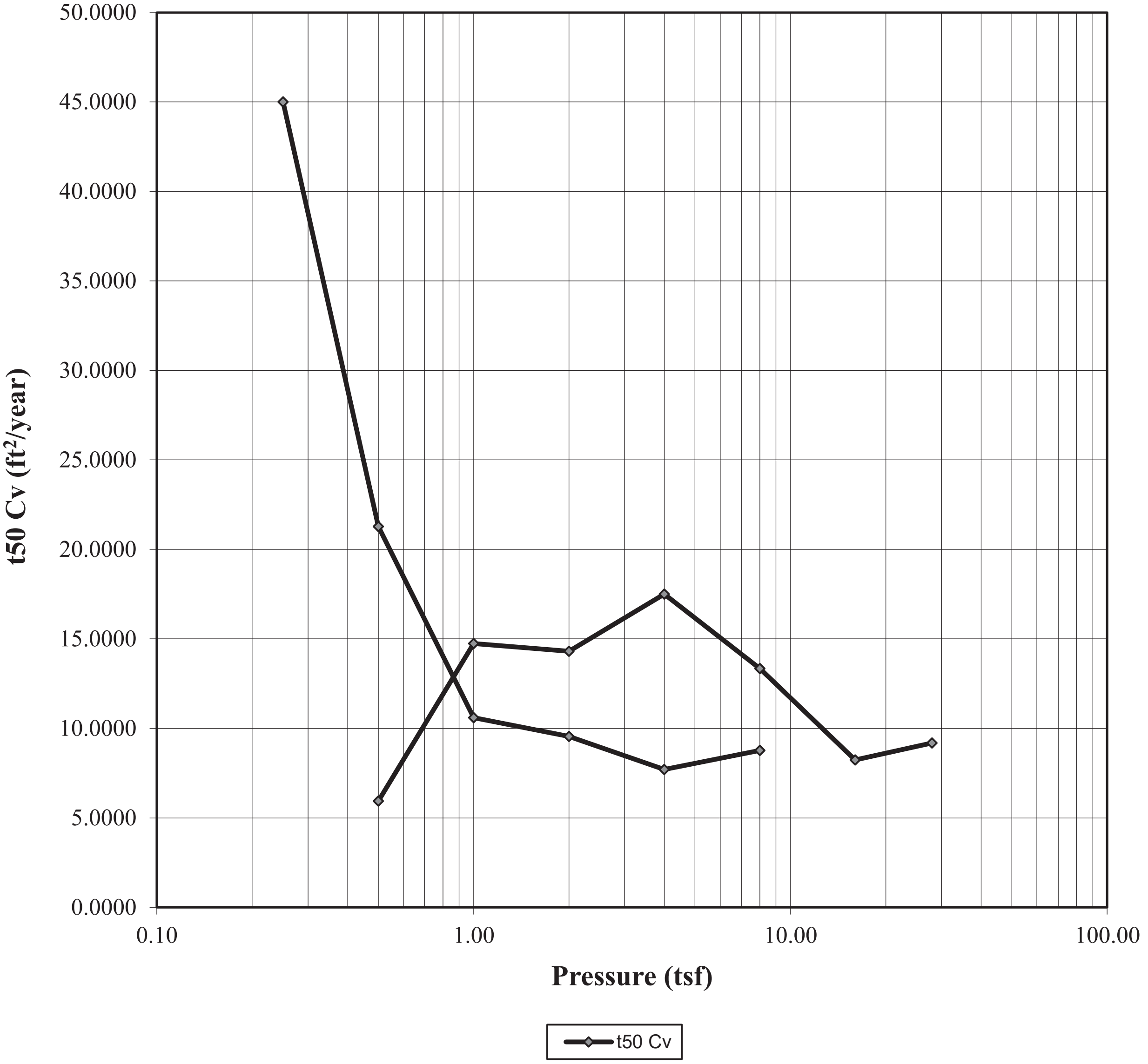
Location: Baton Rouge, LA

ATTACHMENT B

GEOENGINEERS

Consolidation Test

Test Results



	Before	After	Liquid Limits:	37	Test Date:	23 Sep 2013
Moisture (%):	23.39	20.09	**Plastic Limits:**	17		
Dry Density (pcf):	100.84	118.15	**Plasticity Index (%):**	20		
Saturation (%):	96.76	133.02				
Void Ratio:	0.6379	0.3793	**Specific Gravity:**	2.650	Assumed	

Soil Description: Silty Clay (CL)

Project Number: 16710-051-00 **Depth:** 13 - 15 feet

Sample Number: **Boring Number:** 31

Remarks:

Project: Perkins to Picardy Connector

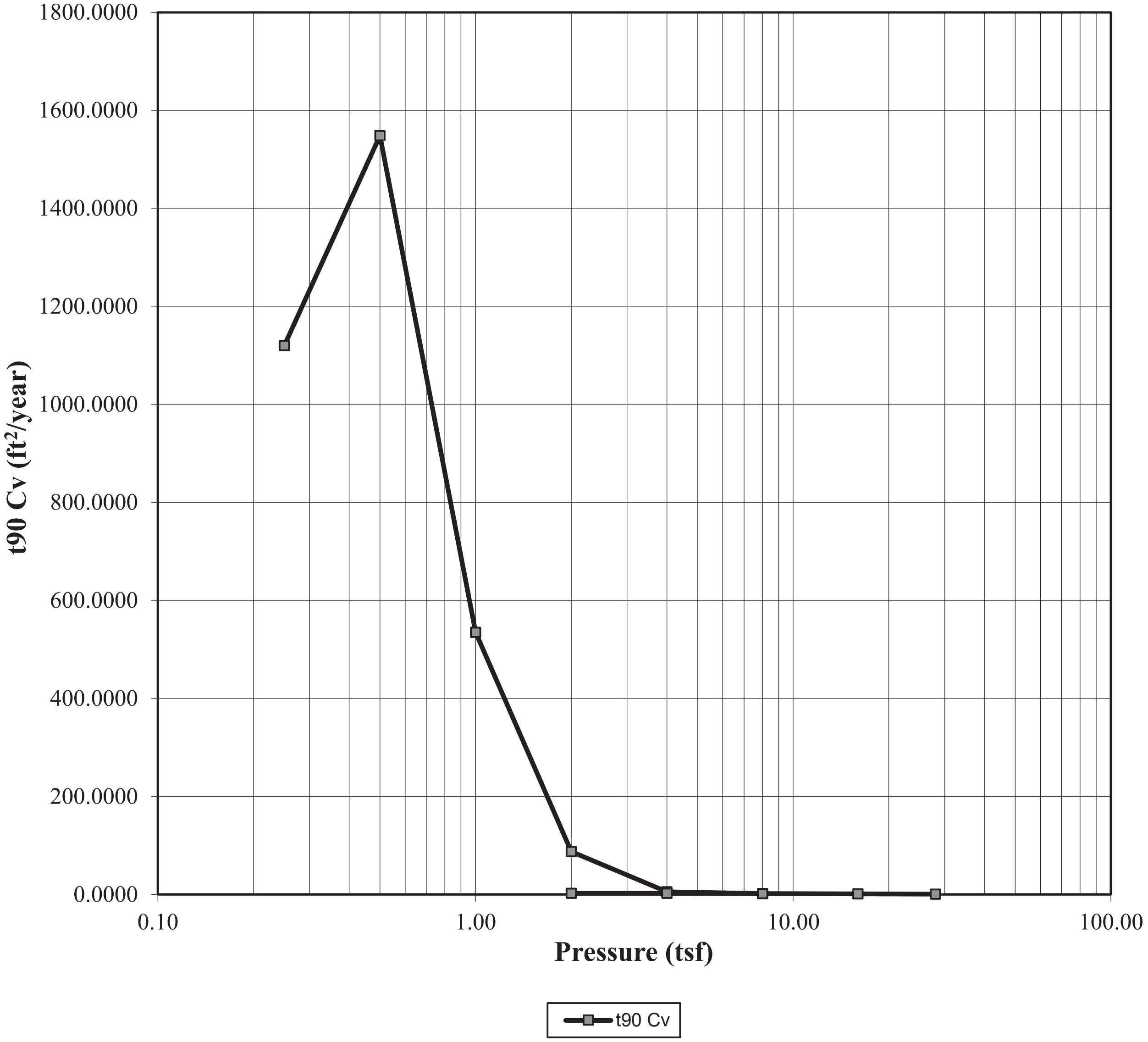
Client: EBR City-Parish/Evans-Graves

Location: Baton Rouge, LA

ATTACHMENT B

Consolidation Test

Test Results



	Before	After	Liquid Limits:	88	Test Date:	17 Feb 2014
Moisture (%):	34.01	35.95	**Plastic Limits:**	27		
Dry Density (pcf):	87.79	89.33	**Plasticity Index (%):**	61		
Saturation (%):	101.90	111.81				
Void Ratio:	0.8815	0.7964	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay (CH)

Project Number: 16710-051-00 **Depth:** 33 - 35 feet

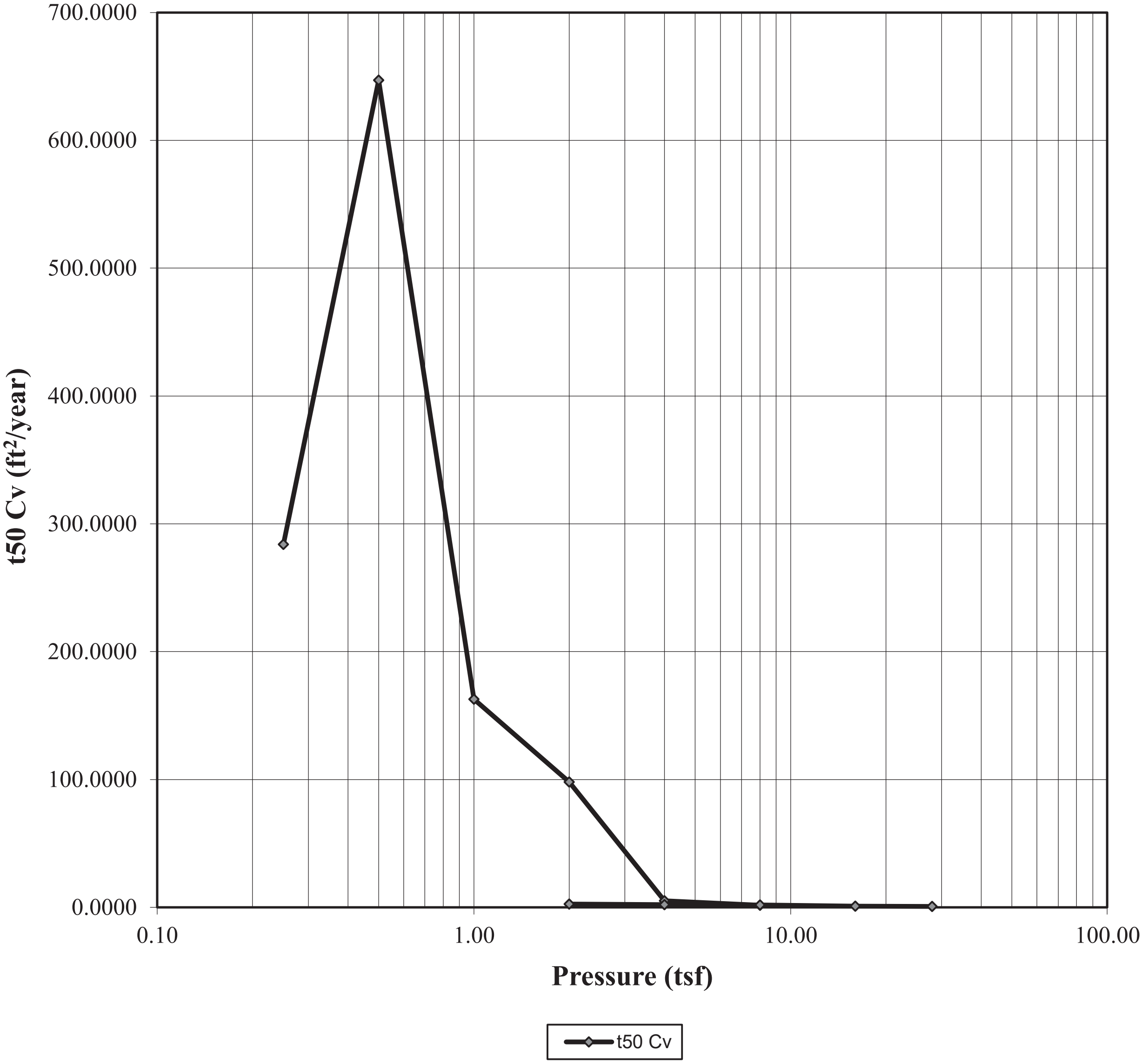
Sample Number: **Boring Number:** 29

Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

Consolidation Test

Test Results



	Before	After	Liquid Limits:	88	Test Date:	17 Feb 2014
Moisture (%):	34.01	35.95	**Plastic Limits:**	27		
Dry Density (pcf):	87.79	89.33	**Plasticity Index (%):**	61		
Saturation (%):	101.90	111.81				
Void Ratio:	0.8815	0.7964	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay (CH)

Project Number: 16710-051-00 **Depth:** 33 - 35 feet

Sample Number: **Boring Number:** 29

Remarks:

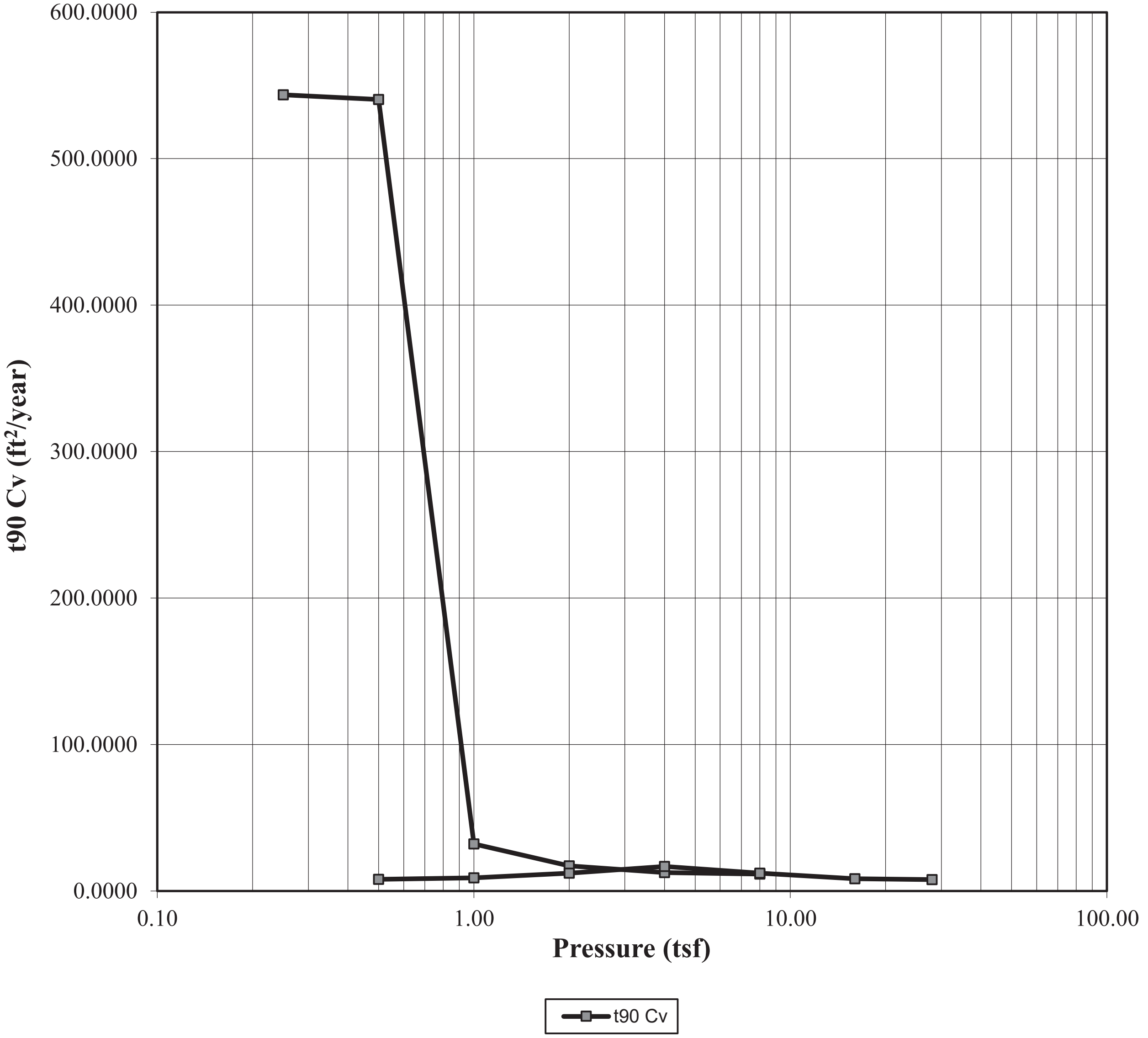
Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

ATTACHMENT B

GeoEngineers

Consolidation Test

Test Results



	Before	**After**	**Liquid Limits:**	47	**Test Date:**	17 Feb 2014
Moisture (%):	24.02	22.56	**Plastic Limits:**	17		
Dry Density (pcf):	100.07	105.53	**Plasticity Index (%):**	25		
Saturation (%):	97.46	105.33				
Void Ratio:	0.6519	0.5085	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 48 - 50 feet

Sample Number: **Boring Number:** 28

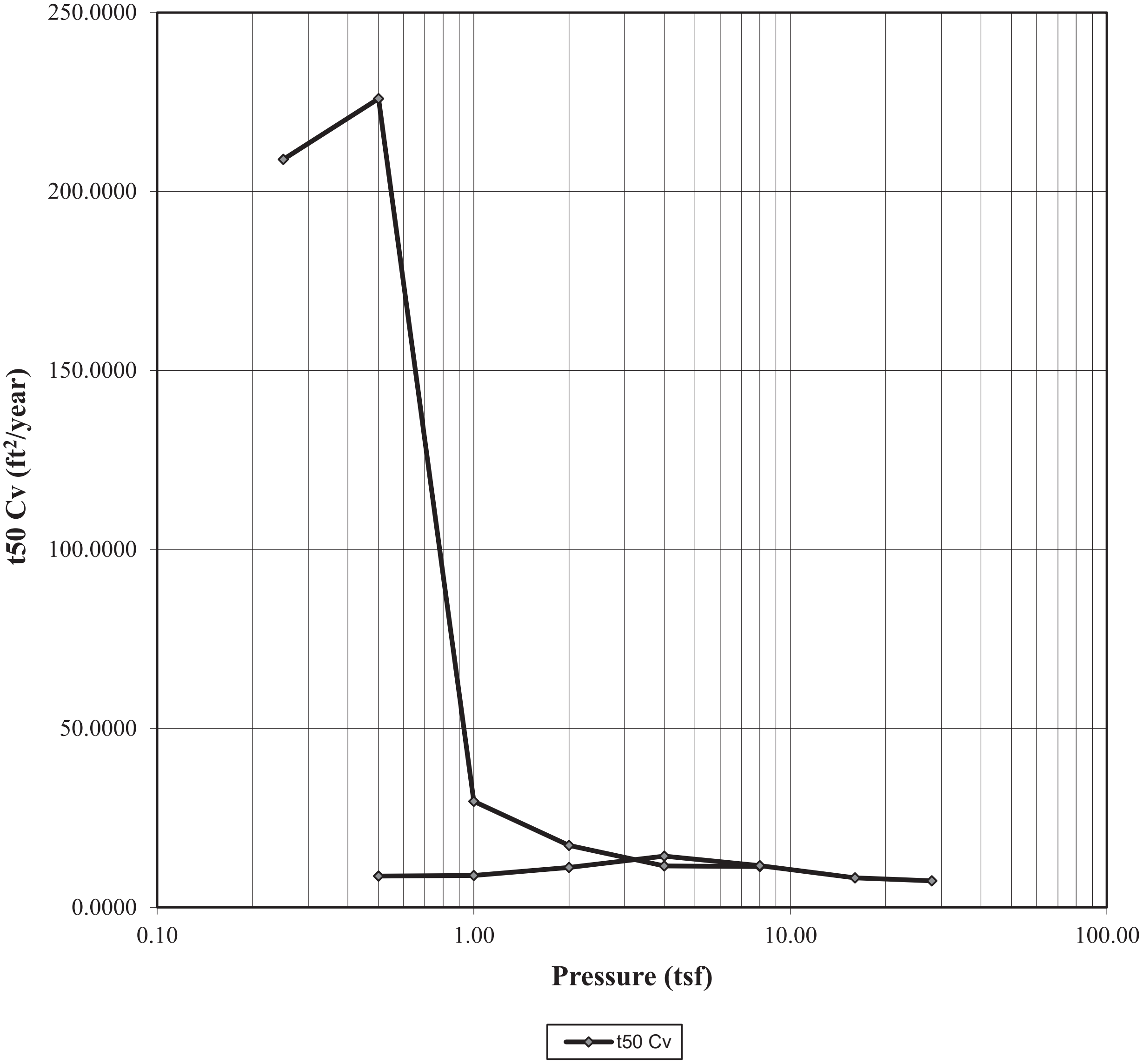
Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

ATTACHMENT B

GEOENGINEERS

Consolidation Test
Test Results



	Before	After	Liquid Limits:	47	Test Date:	17 Feb 2014
Moisture (%):	24.02	22.56	**Plastic Limits:**	17		
Dry Density (pcf):	100.07	105.53	**Plasticity Index (%):**	25		
Saturation (%):	97.46	105.33				
Void Ratio:	0.6519	0.5085	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clay with Silt (CL)

Project Number: 16710-051-00 **Depth:** 48 - 50 feet

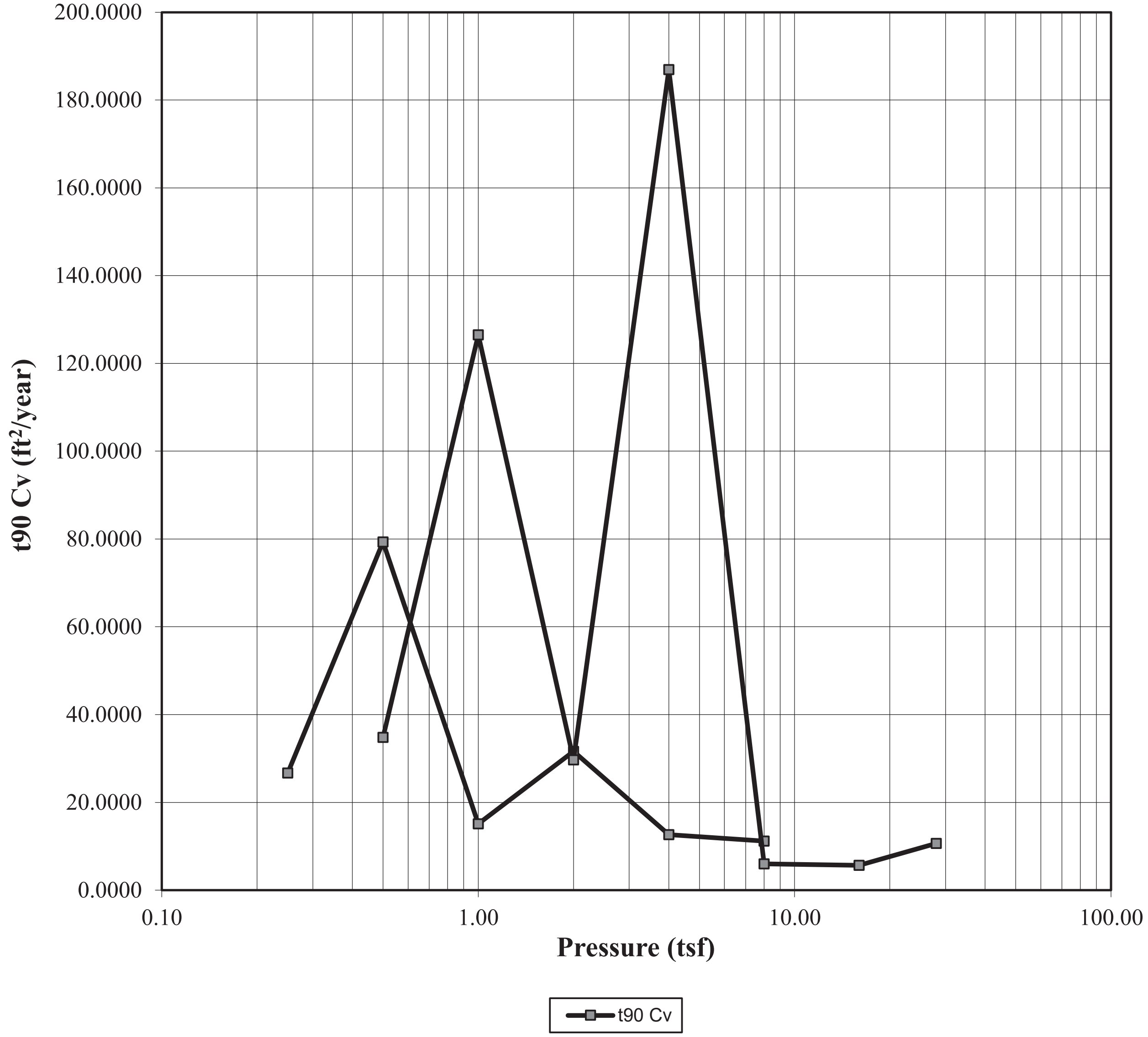
Sample Number: **Boring Number:** 28

Remarks:

Project: Perkins to Picardy Connector
Client: City of Baton Rouge, Parish of EBR, Evans-Graves
Location: East Baton Rouge Parish, LA

Consolidation Test

Test Results



	Before	After	Liquid Limits:	27	Test Date:	24 Sep 2013
Moisture (%):	24.10	20.10	**Plastic Limits:**	20		
Dry Density (pcf):	104.20	112.31	**Plasticity Index (%):**	7		
Saturation (%):	108.67	112.62				
Void Ratio:	0.5866	0.4661	**Specific Gravity:**	2.650	Assumed	

Soil Description: Clayey Silt (CL-ML)

Project Number: 16710-051-00 **Depth:** 23 - 25 feet

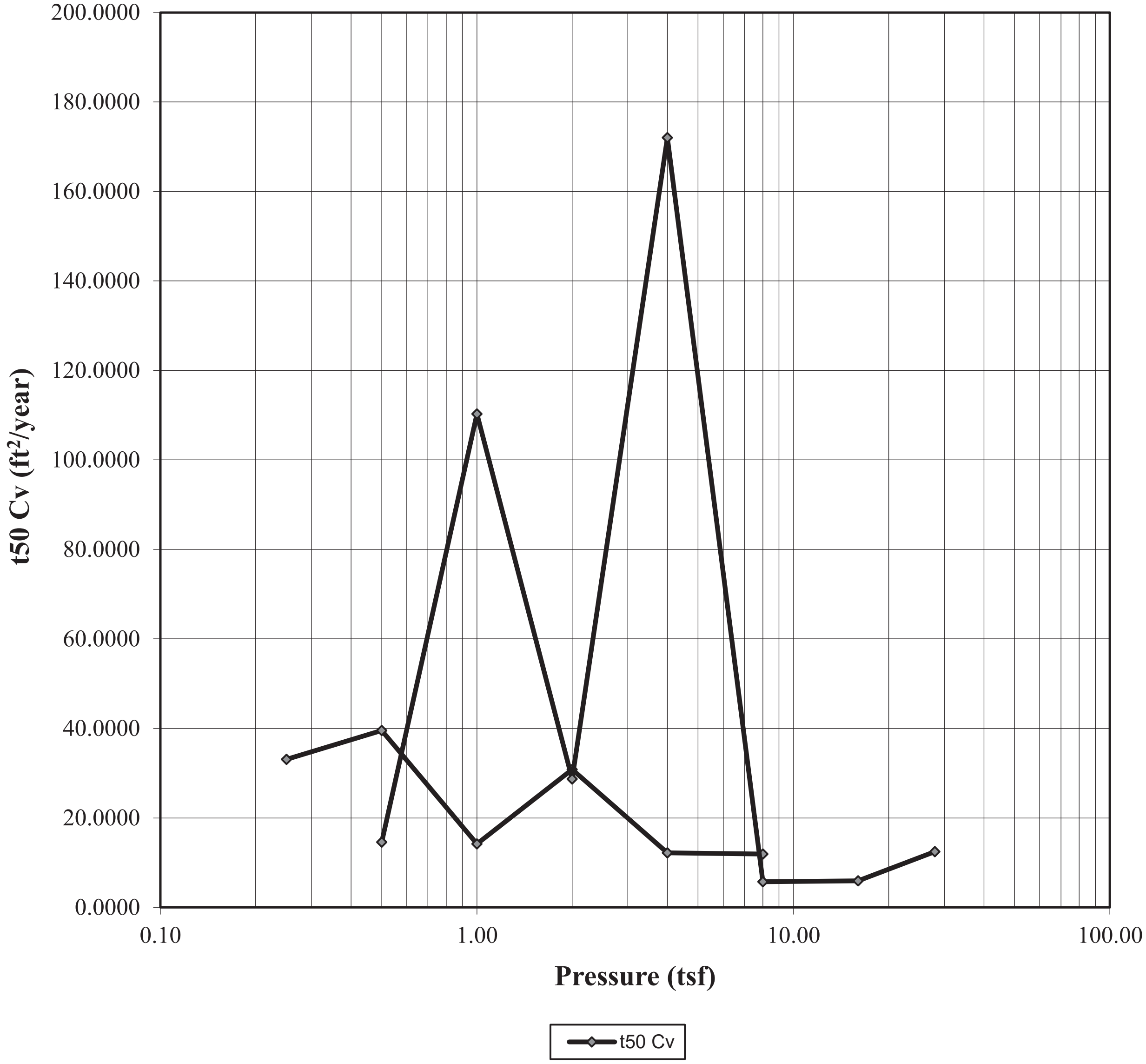
Sample Number: **Boring Number:** 11

Remarks:

Project: Perkins to Picardy Connector
Client: EBR City-Parish/Evans-Graves
Location: Baton Rouge, LA

Consolidation Test

Test Results



	Before	After	Liquid Limits:	27	Test Date:	24 Sep 2013
Moisture (%):	24.10	20.10	**Plastic Limits:**	20		
Dry Density (pcf):	104.20	112.31	**Plasticity Index (%):**	7		
Saturation (%):	108.67	112.62				
Void Ratio:	0.5866	0.4661	**Specific Gravity:**	2.650	Assumed	

Soil Description:	Clayey Silt (CL-ML)		
Project Number:	16710-051-00	**Depth:** 23 - 25 feet	**Remarks:**
Sample Number:		**Boring Number:** 11	
Project:	Perkins to Picardy Connector		
Client:	EBR City-Parish/Evans-Graves		
Location:	Baton Rouge, LA		

APPENDIX B

Drilled Shaft Installation Considerations

APPENDIX B
DRILLED SHAFT INSTALLATION CONSIDERATIONS

The purpose of this appendix is to furnish installation requirements of straight-sided drilled shafts for this project. Topics covered encompass a general description of shaft construction (including excavation stability and work performance details); particulars of steel reinforcement; and concrete quality/placement aspects. All such information is intended to supplement job specific construction specifications.

Excavation Stability

Borehole Excavation

Sizes, depths, and spacing of the shafts should be shown on the plans. Shaft excavations should be performed with a machine powered drilling rig. An augered hole may be excavated "in the dry" unless encountered soil conditions are such that the hole will not stand up without supplementary support techniques. If caving/squeezing occurs, or if there is excess seepage into the excavation, no further drilling should be allowed. The contractor should then be obligated to select a method of advancing the borehole so as to prevent ground movement and/or excess water inflow. These measures may consist of casing the excavation, wet boring with drilling mud, pumping, temporary dewatering, or any other measures that may be required to achieve the desired construction. The cost for any of the measures shall be included in the base bid for the project. No extras should be allowed for the use of these measures or any others that may be required.

Casing Requirements

Temporary casing, when employed as supplementary excavation support, should be of ample strength to withstand handling stresses and the external pressures of the caving soil and/or fluid. It should be water tight, smooth, and its interior should be clean. Generally, such casing is not employed in an excavation with a nominal diameter less than 18 inches. When a stratum of soil is encountered that will not cave or admit a significant amount of water, the bottom of any casing should be sealed in that formation. The excavation should be completed according to plan in the stratum specified. When necessary, the contractor should prepare the bottom of the casing with cutting teeth to facilitate sealing. The casing should be smooth and its interior should be clean. The outside diameter of the casing should not be less than the specified diameter of the drilled shaft. Casing length should be sufficient to provide adequate protection and safety against any caving soil and water inflow. Temporary casing should not be left in the ground except by permission of the engineer.

Casing Retrieval

The contractor should retrieve the casing at a slow, uniform rate after filling it with fluid concrete. Downward velocity of the concrete relative to the rebar cage, which occurs as the casing is pulled, should be kept low to prevent distortion of the cage as well as settlement of the cage due to penetration into the bearing stratum. The pull should be kept in line with the vertical axis of the shaft, and the level of concrete in the casing should be maintained so as to prevent intrusion of soil or groundwater during extraction. Elapsed time from the beginning of concrete placement in a cased shaft, until extraction of the casing is begun, should be consistent with the mix design

Drilling Slurry

Borehole stabilization may be maintained using the slurry-displacement method of construction. Slurry level in the borehole must be kept well above the water table to ensure that no flow occurs into the borehole from the natural water. Excavation should be carried to final depth while the borehole is being stabilized with drilling fluid of ample density and viscosity. The bottom of the excavation should be cleaned by a clean-out bucket of appropriate dimensions, by an air lift, or by other appropriate means. Drilling fluid may be reused, but it should be processed, if necessary, to remove the granular material that is in suspension. No excavations for slush pits shall be made in the ground surface if the wet boring process is used. A portable mud pit shall be used.

Slurry Preparation

The preferred method of forming the slurry is to use a mixing plant, or mixing machine, and prepare the slurry prior to its placement. There are occasions when: (1) it is possible to add bentonite to the water in the excavation and to mix the bentonite with the drilling tools, or (2) to form a slurry by the mixing of suitable in-situ, drilled, fine-grained material during the boring. In all cases, the slurry properties should be tested and recorded prior to concrete placement.

Reinforcement Steel

Reinforcing steel should be the entire length of the shaft and be supported at its base. A minimum of ½ percent reinforcing steel should normally be used. The minimum clear spacing between rebar should be 1½ times the bar diameter. Centralizers on the rebar cage should be used to keep the cage properly positioned. Cross bracing in the form of either wires or reinforcing steel should be omitted from the shaft cage. If additional reinforcement is needed to maintain the rebar character during transit or concrete placement, it should be added at the direction and approval of the structural engineer.

Concrete Issues

Handling Technique

Concrete placement should begin immediately after the shaft has been excavated and the reinforcing steel is in place. Placement should be continuous in the shaft to the cut-off elevation joint indicated on the plans. Mechanical vibration of concrete should not be done: (1) inside a temporary casing because of the possibility that the concrete will arch and move upward when the casing is pulled, and (2) in cases where slurry is used and there is a chance of slurry remaining in the excavation. Vibration or rodding is recommended in other instances to a maximum depth of 5 feet below the top of the concrete column. Concrete that is beginning to take a set should not be disturbed by the excavation of an adjacent shaft: no drilling should be allowed within a clear distance of 5 shaft diameters.

Tremie Placement

Holes excavated using a wet drilling process shall have the concrete installed with a tremie pipe which shall be kept below the surface of fresh concrete at all times during pouring. No concrete shall be dropped through free water. The tremie must be clean and water tight, and the concrete must have good flow characteristics. In order to prevent contamination of the concrete placed initially, the bottom of the tremie or pump line should be sealed with a diaphragm or plate that is pushed away when the hydrostatic pressure from the column of concrete exceeds that of the external fluid. The top of the column of concrete may be contaminated by mixing with the slurry or with water. This contaminated concrete must be removed.

Aggregates

The maximum size of coarse aggregate should be 1/3 of the reinforcement steel clear spacing.

Slump Ranges

The recommended ranges of concrete slump are given for various circumstances:

Slump Range, Inches	Typical Conditions
5 ± 1	Poured into water-free uncased borehole. Widely-spaced reinforcement.
6 ± 1-1/2	Close spacing of reinforcement. Permanent or extracted casing. Shaft diameter less than 30 inches.
7 ± 1	Concrete placed under water or under drilling
slurry.	

Strength

The concrete fill shall have a 28 day ultimate compressive strength of 3000 psi or greater.

Construction Deviation

Drilled shafts shall be installed to within 3 inches of the design locations. Any foundations out more than 3 inches shall have the entire installation surveyed by a licensed surveyor paid by the contractor. The foundation will be analyzed using these as installed locations. Cost for the analysis and any redesign and additional construction, including any additional foundations necessary, shall be borne by the contractor.

APPENDIX C

Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services Are Performed For Specific Purposes, Persons And Projects

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers for their design of the Picardy to Perkins Connector and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Or Geologic Report Is Based On A Unique Set Of Project-Specific Factors

This Geotechnical Engineering Evaluation is for use by Evans-Graves Engineers for their design of the Picardy to Perkins Connector and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, and slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical And Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering Report Or Geologic Report Could Be Subject To Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw The Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors A Complete Report And Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors Are Responsible For Site Safety On Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic And Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project

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Geotechnical Engieering Servcies

Paulat Boulevard
(Picardy to Perkins Connector Project
Baton Rouge, Louisiana

for

Evans-Graves Engineering, Inc.

November 9, 2016

GeoEngineers
Earth Science + Technology

ATTACHMENT B

Geotechnical Engineering Services

Paulat Boulevard
(Picardy to Perkins Connector Project)
Baton Rouge, Louisiana

for
Evans-Graves Engineers, Inc.

November 9, 2016

GEOENGINEERS
11955 Lakeland Park Blvd., Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

ATTACHMENT B

Geotechnical Engineering Services
Paulat Boulevard
(Picardy to Perkins Connector Project)
Baton Rouge, East Baton Rouge Parish, Louisiana

File No. 16710-051-01

November 9, 2016

Prepared for:

Evans-Graves Engineers, Inc.
9029 Jefferson Highway, Suite 200
Baton Rouge, Louisiana 70809

Attention: Gerald G. Menard, PE

Prepared by:

GeoEngineers, Inc.
11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

For Ivy A. Harmon, EI
Geotechnical Engineer

Larry D. Sant, PE
Associate Geotechnical Engineer

LARRY DEAN SANT
License No. 35625
11-09-2016

for

James M. Aronstein, Jr., PE
Principal

IAH: LDS: JMA: cc

GEOENGINEERS

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INTRODUCTION

This report is an addendum to the Geotechnical Engineering Services report provided on July 11, 2014, and presents the results of our geotechnical engineering services in support of your design of the Paulat Boulevard (Picardy to Perkins Connector Project) in Baton Rouge, Louisiana. Our understanding of the project was developed through discussions with and review of materials transmitted by Evans-Graves Engineers, Inc. (Evans-Graves). The approximate project location is shown on the Vicinity Map, Figure 1.

We understand that the project will include about 3,000 lineal feet of new roadway, two pairs of bridges over Dawson Creek, one railroad overpass bridge, one below-grade roadway with retaining walls, and privacy walls. The project plan is shown in Figure 2.

SCOPE OF SERVICES

Our services for this project were completed in general accordance with our revised proposal dated November 28, 2012, the supplemental agreement 001 proposed August 15, 2014, and supplemental agreement 002 proposed September 10, 2015. The original agreement was signed on June 13, 2013 for authorization of the services, supplemental agreement 001 was authorized April 22, 2015, and supplemental agreement 002 was authorized March 9, 2016. The scope of services was based on the information provided by you during our meetings and correspondence. The purpose of our geotechnical services is to provide geotechnical recommendations specific to this site for design and construction based on site exploration, laboratory testing and geotechnical engineering analyses. Our services are outlined as follows:

1. Contacted Louisiana "One-Call" to notify them of our intent to perform soil borings and piezometer installation at the sites and to clear the boring locations of potential underground utilities.

2. Obtained property access agreements from GGP/Mall of Louisiana LLC.

3. Installed and monitored 2 piezometers for underpass roadway uplift design support. We completed these drilled borings and piezometer installations to 35 feet and 20 feet below ground surface.

   The soil borings at the piezometer locations were sampled from the ground surface in 2-foot intervals and on 5-foot centers with a truck-mounted drill rig. Our field representative logged the explorations and 2-inch well piezometer installations, and obtained samples of soil from each boring. Sampling involved obtaining undisturbed cores of cohesive clay/silt with 3-inch outside diameter thin-walled Shelby tubes.

4. Evaluated global stability at Dawson Creek bridges abutments.

5. Provided design support for the railroad shoofly temporary sheet pile design.

6. Provided support for railroad abutment and wingwall design by Stantec. Recommendations included an abutment pressure diagram, drilled shaft capacities, and lateral earth pressures (L-pile input parameters).

ATTACHMENT B

SITE CONDITIONS

General

We developed an understanding of site subsurface conditions by review of published geologic resources and our explorations completed previously for this project. Detailed descriptions of our site exploration and laboratory testing programs along with exploration logs and laboratory test results are presented in the July 11, 2014 report.

The design profiles developed as part of the July 11, 2014 report are included in Appendix A as reference.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater Measurement

Piezometer Installation

Piezometers were installed at two locations along the project alignment adjacent to the proposed Railway underpass near the existing Mall of Louisiana. The approximate piezometer locations are shown on the Well Location Plan, Figure 3. As-drilled piezometer locations (coordinates) were determined by handheld GPS.

Two piezometers were installed (B-21A and B-21B) because two separate groundwater tables were observed during initial site exploration. B-21A was installed to a depth of 35 feet and B-21B was installed to a depth of 20 feet. The piezometers were installed near boring B-21 that was drilled and tested for the first report.

Conclusions from Piezometer Data

The piezometer data serves a dual function: 1) to provide information to the construction bidders for possible temporary groundwater during construction, which the contractor can use to determine need for possible dewatering depending on means and methods; and 2) to provide information for designers for permanent groundwater mediation design to reduce the potential for uplift pressures below the underpass roadway and provide data for design to estimate the quantity of groundwater to be mediated. Although groundwater was encountered at varying depths in our borings and in the piezometers, for design and construction the groundwater level (saturated zone) should be expected at the ground surface, which is common for this part of south Louisiana.

We encountered a medium strength clay layer at the ground surface at piezometer location B-21A. The soil strength increased to very stiff with depth. We observed silt lenses and silt seams below about 23 feet below ground surface (bgs). At the B-21B ground surface, we encountered a hard clay that continued to about 5 feet bgs. Stiff to very stiff clay with silt and gravel pockets was observed below about 5 feet bgs. Logs of the piezometer borings are included in Appendix A.

The water elevation in each piezometer was measured once per month for the first 5 months as planned and then a final reading taken right before completion of this final report. The resulting graph of groundwater elevation is shown in Figure 4. The groundwater elevations have remained relatively steady since observation was begun in December 2015. Based on this data and our experience, we recommend that design against uplift be completed for the underpass pavement. Drainage control also should be installed below the underpass.

Global Stability

General

We evaluated both the Dawson Creek bridge abutment slopes and the Mechanically Stabilized Earth (MSE) walls for global stability. The global stability was evaluated for both short-term construction conditions and long-term drained conditions. GeoEngineers performed stability analyses using Spencer's method, which considers both shear and normal interslice forces. The method involves a circular search and takes into account both moment and force equilibrium. Spencer's method of slope stability analysis was completed using the computer program SLOPE/W (2015 version), developed by GEO-SLOPE International Ltd. SLOPE/W is a software product that computes factors of safety against potential failure based on limit equilibrium theory to evaluate the stability of earth slopes.

Based on the guidelines presented in the 2014 AASHTO LRFD Bridge Design Specifications, 7th Edition, *Section 11.6.2.3 – Overall Stability* states that "an appropriate resistance factor": for the Dawson Creek abutment slope parameters "may be taken as… 0.75", which equates to a minimum safety factor of 1.3; and for the wall parameters "may be taken as… 0.62", which equates to a minimum safety factor of 1.5.

Dawson Creek Bridges Global Stability

We understand that the bridges over Dawson Creek, on Paulat Boulevard and on Backcourt Drive are at-grade crossings. However, the grade dropping off into the Dawson Creek channel adjacent to each bridge abutment significantly increases the approach embankment thickness near the abutments despite the at-grade bridge crossings. Accordingly, we evaluated these slopes for global stability.

The resulting factors of safety against global stability are presented in the following table and on Figures 5 and 6.

TABLE 1. DAWSON CREEK BRIDGES GLOBAL SLOPE STABILITY FACTOR OF SAFETY

Global Slope Stability Analysis Location	Short-Term Factor of Safety	Long-Term Factor of Safety
Paulat Boulevard Bridge over Dawson Creek		
North Embankment	1.561	1.739
South Embankment	1.515	1.553
Backcourt Drive Bridge over Dawson Creek		
North Embankment	1.647	1.697
South Embankment	1.563	1.388

MSE Walls Global Stability

We understand that MSE walls will be used along the Paulat Blvd project. MSE wall 1 (MSEW No. 1) is on the north side of Paulat Blvd from about Station 130+29 eastward to about Station 136+14, where it terminates at the KCS RR abutment. MSEW No. 3 begins at the east side of the KCS RR abutment at about Station 136+92, and continues running eastward along the north side of Paulat Blvd, then turns northward to run parallel to the Mall of Louisiana Blvd until it terminates at about Station 346+00. MSEW No. 2 runs eastward on the south side of Paulat Blvd from about Station 131+40 to 139+30.

We evaluated wall global stability at controlling wall cross-sections, selected to have the greatest wall height and highest load acting on the wall. We based wall geometry on plans provided March 2014, and assumed a 1-foot wall footing.

To achieve a minimum global stability of 1.5, the required geotextile length and long-term design strength are summarized in Table 2 below. Embankment fill is assumed to have a unit weight of 128 pcf and a friction angle of at least 32 degrees.

TABLE 2. MSE WALL GLOBAL SLOPE STABILITY MINIMUM REQUIREMENTS

MSEW No.	Minimum Geotextile Length (wall reinforced zone)	Minimum Geotextile Design Strength (lb/ft)
1	1.0 * Wall Height	2,575
2	0.7 * Wall Height	1,096
3	1.0 * Wall Height	2,575

Temporary Anchored Sheet Pile Walls

General

We understand that temporary anchored sheet pile walls will be used during construction of Paulat Boulevard roadway underpass below the railroad. Because this is a tall sheet pile wall supporting heavy rail loads, we expect it will need extra support to resist wall deflection. Accordingly, we expect that either a system of tieback anchors or dead-man anchors will be designed and installed by the contractor to support the wall, depending upon the contractor's means and methods. We understand that the temporary anchored sheet pile wall will be designed by the contractor.

Global Stability of Sheet Pile Walls

We modeled the global stability of the railroad shoofly temporary sheet pile wall and results are presented in Figure 7. The model assumed the total excavation height of 31 feet. To achieve a factor of safety greater than 1.5 against global rotation, the sheet pile must be embedded a minimum of 6 feet below the bottom of the excavation. The minimum sheet pile embedment of 6 feet was reached by iteration to obtain a safety factor greater than 1.5 for global stability. Larger embedment depths will have higher factors of safety against global stability. We expect that this minimum embedment depth for global stability will not govern the sheet pile depth requirements as obtained from an anchored sheet pile wall design. The parameters for the modeled sheet pile wall are minimum recommendations based on this model to achieve a minimum factor of safety as stated by LRFD Section 11, Section 6.2.3.

Abutment and Wingwalls

Lateral Earth Pressures

The railroad bridge abutment was designed with several drilled shafts that not only support downward loads, but also act as a retaining wall. The lateral earth pressures experienced by the abutment and wingwalls are shown on the lateral earth pressure diagram, Figure 8. The total active lateral earth pressures are equal to the summation of the active earth pressures due to: 1) the railroad load surcharge; 2) the water pressure; and 3) either the short-term or long-term soil pressure, as shown on the active side of the wall in Figure 8. The total passive lateral earth pressures are equal to the summation of the passive earth pressures due to: 1) the water pressure; and 2) either the short-term or the long-term soil pressure, as shown on the passive side of the wall in Figure 8.

Drilled Shaft Axial Capacity

We understand that the 42-inch diameter drilled shafts supporting the abutment and wingwalls will be subject to both axial and lateral loading. The axial load design capacity curve is presented in Figure 9. To achieve the required service load III capacity of 426 kips, the drilled shaft should be installed to a tip elevation of at least -81 feet. Appendix B includes information for drilled shaft installation considerations.

Lateral Load Analysis

The lateral load model of the drilled shafts requires input parameters. Figure 10 details the input parameters for the computer program L-Pile that are appropriate for drilled shaft lateral load analysis at the railroad abutment and wingwalls.

LIMITATIONS

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers and their design team for their design of the Paulat Boulevard (Picardy to Perkins Connector) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form or hard copy of this document (email, text, table, and/or figure), if provided, and any attachments are only a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix C titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

We appreciate the opportunity to work with you on this project. If you have any questions regarding this report, or if you need additional information, please call.

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FIGURES

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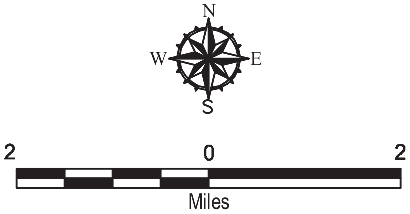

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Topographic image was taken from USGS, 100K Template, Quad: Baton Rouge, Dated 1983

Vicinity Map

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

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Figure 1

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Notes:
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Reference: 1. Aerial image was taken from Google Earth Pro., Licensed to GeoEngineers Inc., Imagery Dated: 1/19/2013
2. Base drawing was provided by Evans-Graves Engineers, ACAD-2011-12500xdesign with bike path.dwg, Dated: 2/27/2014

Project Site Plan

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

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Figure 2

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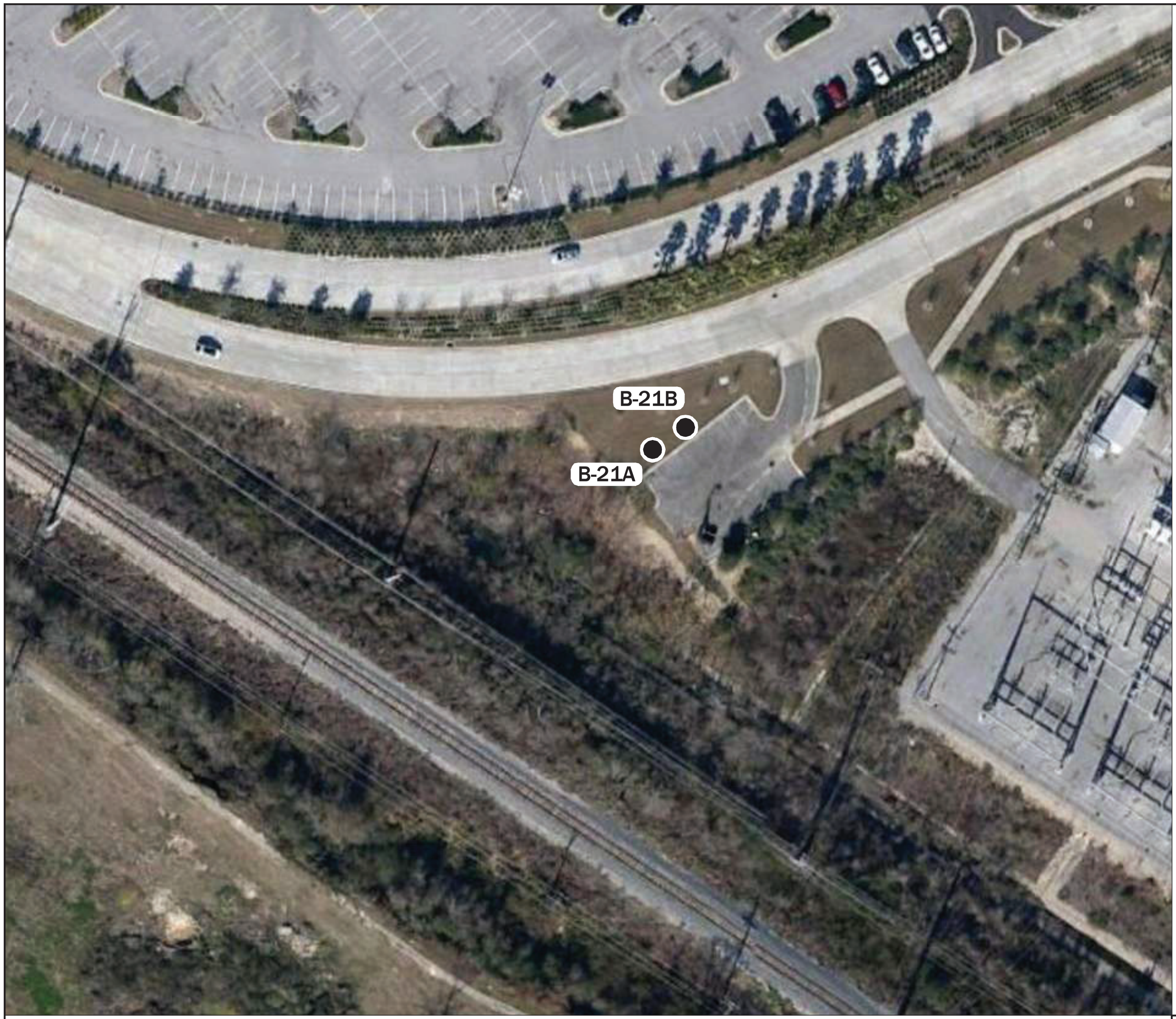
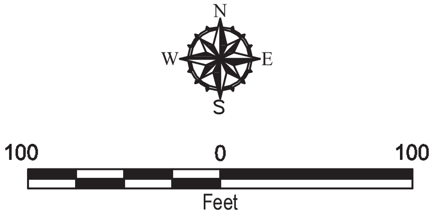


BORING DETAILS

BORING #	LATITUDE	LONGITUDE	DEPTH (FT)
B-21A	N30° 23' 09.30"	W91° 05' 13.30"	35'
B-21B	N30° 23' 09.40"	W91° 05' 13.10"	20'

Legend

● **B-21A** Piezometer Location



WELL LOCATION PLAN

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

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Figure 3

Notes:
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Reference: Aerial image was taken from Google Earth Pro., Licensed to GeoEngineers Inc., Imagery Dated 1/19/2013

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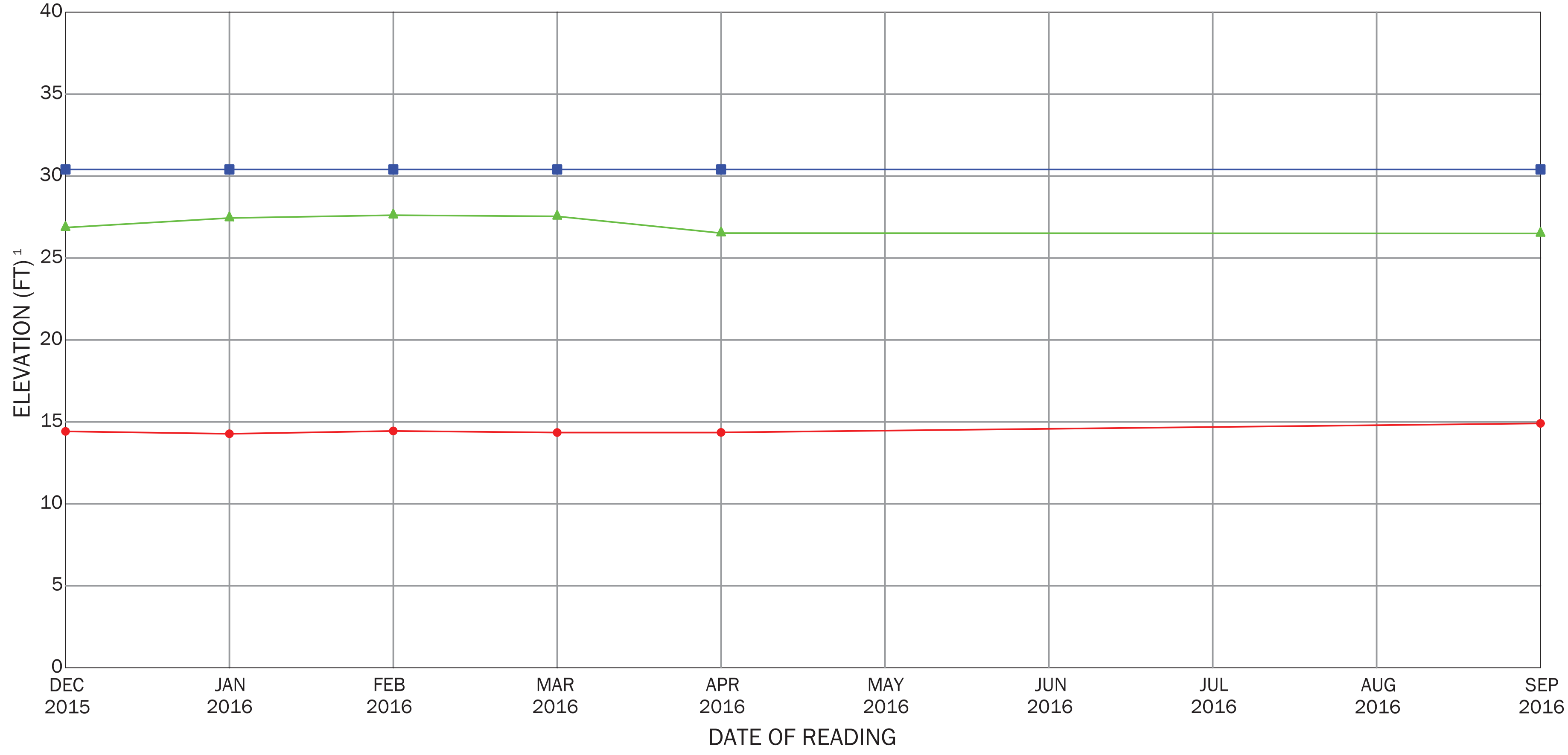
ATTACHMENT B



Notes:

1. Although groundwater was encountered at varying depths in the borings and piezometers, for design and construction the groundwater level (saturated zone) should be expected at the ground surface
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Legend

- ■ Ground Surface
- ● Piezometer B-21A
- ▲ Piezometer B-21B

Piezometer Readings

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

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Figure 4

ATTACHMENT B

NORTH PAULAT BLVD EMBANKMENT
LONG-TERM
B-11, B-12 & B-13 DESIGN PROFILE

Name: CL (EL -95 to -120) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
Name: SM (EL -90 to -95) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 0 psf Phi': 23 °
Name: SM, with clay (EL -75 to -90) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -70 to -75) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -45 to -70) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -40 to -45) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -25 to -40) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL-15 to -25) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -10 to -15) Model: Mohr-Coulomb Unit Weight: 134 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 0 to -10) Model: Mohr-Coulomb Unit Weight: 133 pcf Cohesion': 0 psf Phi': 23 °
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Name: CL (EL 15 to 5) Model: Mohr-Coulomb Unit Weight: 126 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL 20 to 15) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 0 psf Phi': 23 °
Name: Fill Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 23 °
Name: 30# riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °
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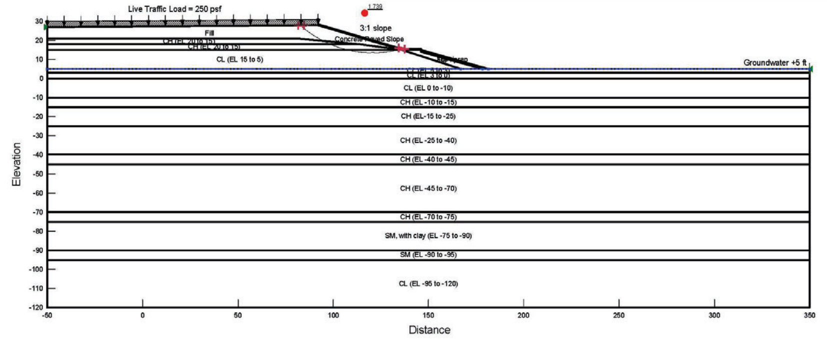

SOUTH PAULAT BLVD EMBANKMENT
LONG-TERM
B-11, B-12 & B-13 DESIGN PROFILE

Name: CL (EL -95 to -120) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
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Name: CH (EL -45 to -70) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -40 to -45) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -25 to -40) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -15 to -25) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 0 psf Phi': 23 °
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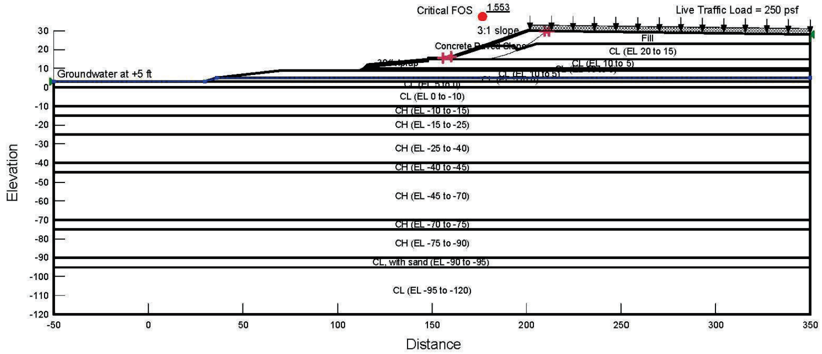

NORTH PAULAT BLVD EMBANKMENT
SHORT-TERM
B-11, B-12 & B-13 DESIGN PROFILE

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Name: SM, with clay (EL -75 to -90) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 1,360 psf Phi': 0 °
Name: CH (EL -70 to -75) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 690 psf Phi': 0 °
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Name: CH (EL -25 to -40) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,680 psf Phi': 0 °
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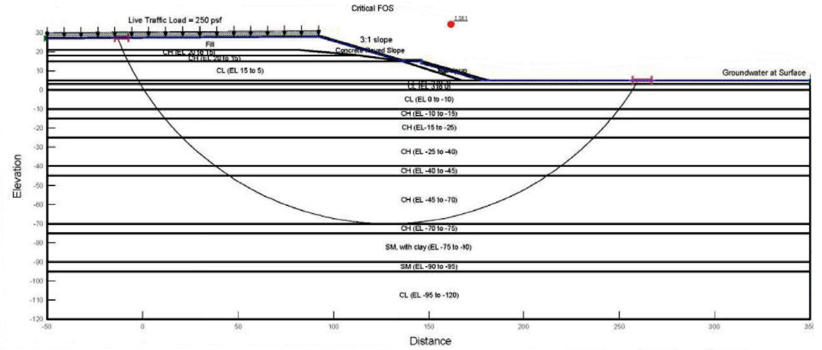
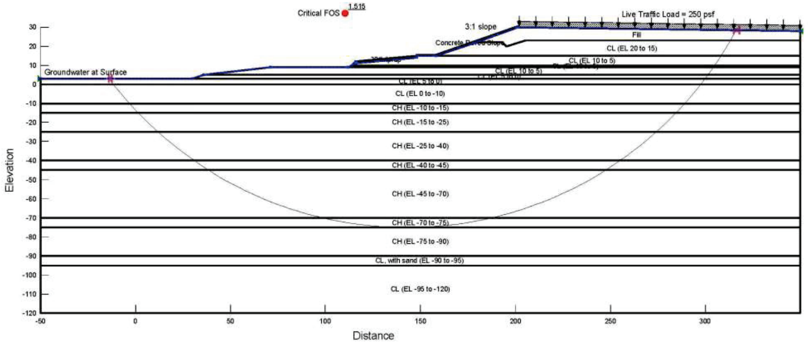
Name: CL (EL 3 to 0) Model: Mohr-Coulomb Unit Weight: 139 pcf Cohesion': 710 psf Phi': 0 °
Name: CL (EL 5 to 3) Model: Mohr-Coulomb Unit Weight: 139 pcf Cohesion': 710 psf Phi': 0 °
Name: CL (EL 15 to 5) Model: Mohr-Coulomb Unit Weight: 126 pcf Cohesion': 900 psf Phi': 0 °
Name: CH (EL 20 to 15) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 500 psf Phi': 0 °
Name: Fill Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 600 psf Phi': 0 °
Name: 30# riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °
Name: Concrete Paved Slope Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 3,000 psf Phi': 0 °



SOUTH PAULAT BLVD EMBANKMENT
SHORT-TERM
B-11, B-12 & B-13 DESIGN PROFILE

Name: CL (EL -95 to -120) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 2,140 psf Phi': 0 °
Name: CL, with sand (EL -90 to -95) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 980 psf Phi': 0 °
Name: CH (EL -75 to -90) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 1,360 psf Phi': 0 °
Name: CH (EL -70 to -75) Model: Mohr-Coulomb Unit Weight: 129 pcf Cohesion': 690 psf Phi': 0 °
Name: CH (EL -45 to -70) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 500 psf Phi': 0 °
Name: CH (EL -40 to -45) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 2,220 psf Phi': 0 °
Name: CH (EL -25 to -40) Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,680 psf Phi': 0 °
Name: CH (EL -15 to -25) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 1,440 psf Phi': 0 °
Name: CH (EL -10 to -15) Model: Mohr-Coulomb Unit Weight: 134 pcf Cohesion': 2,330 psf Phi': 0 °
Name: CL (EL 0 to -10) Model: Mohr-Coulomb Unit Weight: 133 pcf Cohesion': 1,210 psf Phi': 0 °
Name: CL (EL 5 to 0) Model: Mohr-Coulomb Unit Weight: 139 pcf Cohesion': 710 psf Phi': 0 °
Name: CL (EL 10 to 5) Model: Mohr-Coulomb Unit Weight: 126 pcf Cohesion': 900 psf Phi': 0 °
Name: CL (EL 20 to 15) Model: Mohr-Coulomb Unit Weight: 121 pcf Cohesion': 500 psf Phi': 0 °
Name: Fill Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 600 psf Phi': 0 °
Name: 30# riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °
Name: Concrete Paved Slope Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 3,000 psf Phi': 0 °



GeoEngineers

PAULAT BOULEVARD BRIDGE
OVER DAWSON CREEK -
GLOBAL STABILITY

NO.	DATE	REVISION DESCRIPTION	BY

DESIGNED: IAH
CHECKED: LDS
DETAILED IAH
CHECKED JMA
DATE 3/21/2014
SHEET 1 OF 1

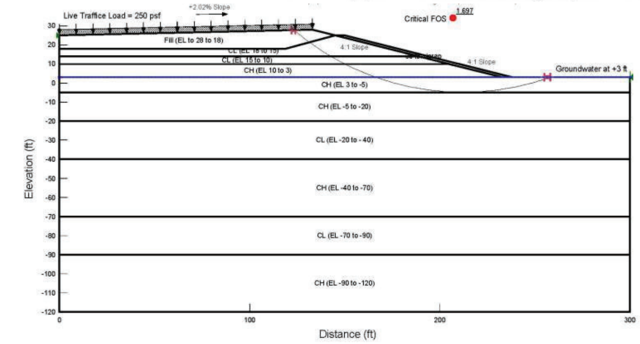
PARISH EAST BATON ROUGE
FEDERAL PROJECT
PROJECT 12-CS-HC-0043

FIGURE 5a

ATTACHMENT B

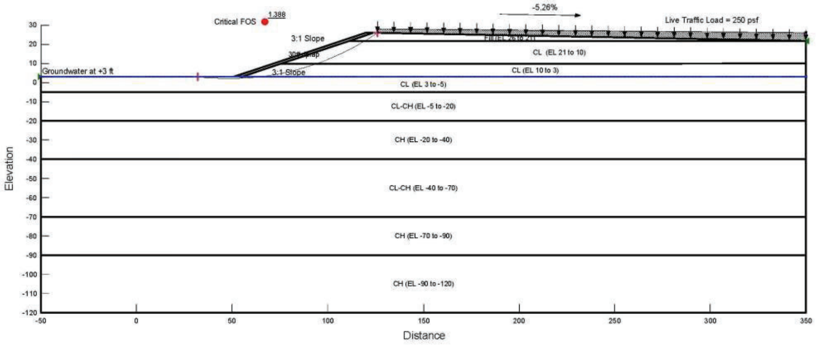
NORTH BACKCOURT DR. EMBANKMENT
LONG-TERM
B-31, B-32 & B-33 DESIGN PROFILE

Name: CH (EL -90 to -120) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL -70 to -90) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -40 to -70) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL -20 to - 40) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 0 psf Phi': 23 °
Name: Fill (EL to 28 to 18) Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 18 to 15) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 15 to 10) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL 10 to 3) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -5 to -20) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL 3 to -5) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: 30 lb. riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °



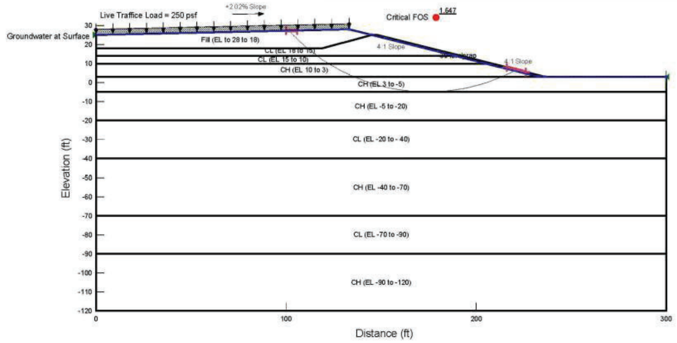
Name: Fill (EL 26 to 21) Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 21 to 10) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 10 to 3) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: CL (EL 3 to -5) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: CL-CH (EL -5 to -20) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -20 to -40) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 0 psf Phi': 23 °
Name: CL-CH (EL -40 to -70) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -70 to -90) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 0 psf Phi': 23 °
Name: CH (EL -90 to -120) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 0 psf Phi': 23 °
Name: 30# riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °

SOUTH BACKCOURT DR. EMBANKMENT
LONG-TERM
B-31, B-32 & B-33 DESIGN PROFILE



NORTH BACKCOURT DR. EMBANKMENT
SHORT-TERM
B-31, B-32 & B-33 DESIGN PROFILE

Name: CH (EL -90 to -120) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 2,100 psf Phi': 0 °
Name: CL (EL -70 to -90) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 500 psf Phi': 0 °
Name: CH (EL -40 to -70) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 2,600 psf Phi': 0 °
Name: CL (EL -20 to - 40) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 1,900 psf Phi': 0 °
Name: Fill (EL to 28 to 18) Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 600 psf Phi': 0 °
Name: CL (EL 18 to 15) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 800 psf Phi': 0 °
Name: CL (EL 15 to 10) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 800 psf Phi': 0 °
Name: CH (EL 10 to 3) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 700 psf Phi': 0 °
Name: CH (EL -5 to -20) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 1,900 psf Phi': 0 °
Name: CH (EL 3 to -5) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 700 psf Phi': 0 °
Name: 30 lb. riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °



Name: Fill (EL 26 to 21) Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 600 psf Phi': 0 °
Name: CL (EL 21 to 10) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 800 psf Phi': 0 °
Name: CL (EL 10 to 3) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 700 psf Phi': 0 °
Name: CL (EL 3 to -5) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 700 psf Phi': 0 °
Name: CL-CH (EL -5 to -20) Model: Mohr-Coulomb Unit Weight: 132 pcf Cohesion': 1,900 psf Phi': 0 °
Name: CH (EL -20 to -40) Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 1,900 psf Phi': 0 °
Name: CL-CH (EL -40 to -70) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 2,600 psf Phi': 0 °
Name: CH (EL -70 to -90) Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 500 psf Phi': 0 °
Name: CH (EL -90 to -120) Model: Mohr-Coulomb Unit Weight: 127 pcf Cohesion': 2,100 psf Phi': 0 °
Name: 30# riprap Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 0 psf Phi': 40 °

SOUTH BACKCOURT DR. EMBANKMENT
SHORT-TERM
B-31, B-32 & B-33 DESIGN PROFILE

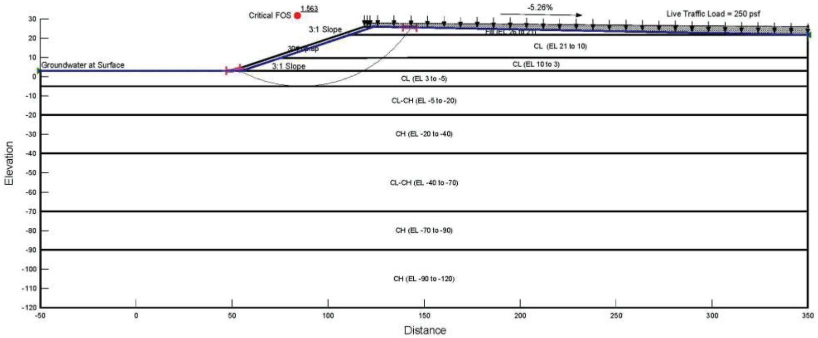


FIGURE 5b

PARISH	EAST BATON ROUGE	
FEDERAL PROJECT		
PROJECT	12-CS-HC-0043	
DESIGNED:	IAH	
CHECKED:	LDS	
DETAILED	IAH	
CHECKED	JMA	
DATE	3/21/2014	
SHEET	1 OF 1	

NO.	DATE	REVISION DESCRIPTION	BY

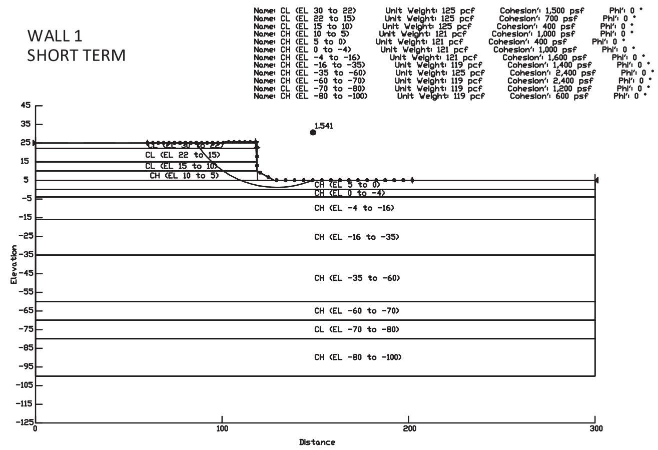
BACKCOURT DRIVE BRIDGE
OVER DAWSON CREEK
- GLOBAL STABILITY

PUBLIC WORKS

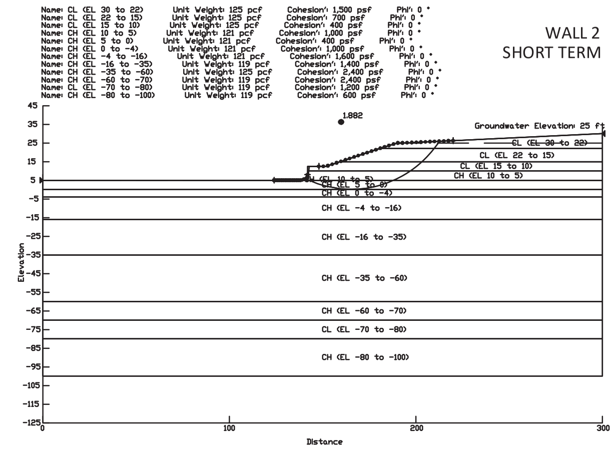
GEOENGINEERS

ATTACHMENT B

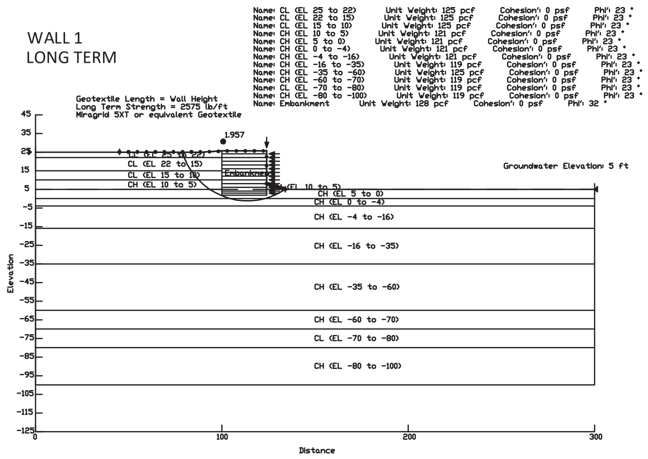
WALL 1
SHORT TERM



WALL 2
SHORT TERM



WALL 1
LONG TERM



WALL 2
LONG TERM

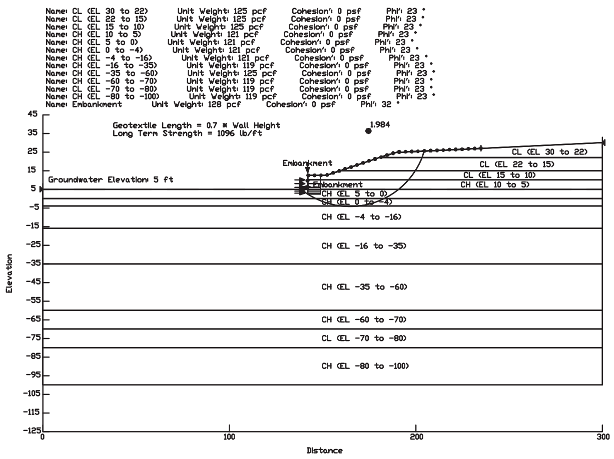


FIGURE	6a		
PARISH	EAST BATON ROUGE	DESIGNED:	IAH
FEDERAL PROJECT		CHECKED:	LDS
PROJECT	12-CS-HC-0043	DETAILED	IAH
		CHECKED	JMA
		DATE	11/9/2016
		SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

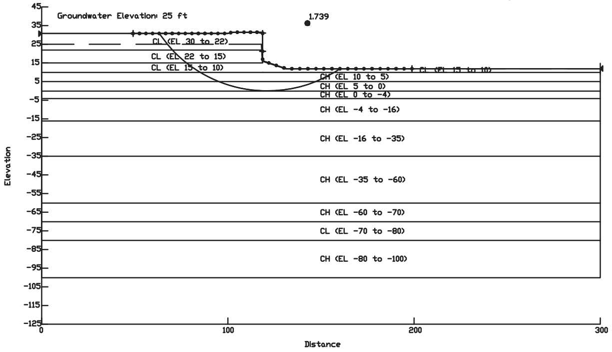
PAULAT BOULEVARD
MSE WALL
- GLOBAL STABILITY

GEOENGINEERS

ATTACHMENT B

WALL 3
SHORT TERM

Name: CL (EL 30 to 22)	Unit Weight: 125 pcf	Cohesion': 1,500 psf	Phi': 0 °
Name: CL (EL 22 to 15)	Unit Weight: 125 pcf	Cohesion': 700 psf	Phi': 0 °
Name: CL (EL 15 to 10)	Unit Weight: 125 pcf	Cohesion': 400 psf	Phi': 0 °
Name: CH (EL 10 to 5)	Unit Weight: 121 pcf	Cohesion': 1,000 psf	Phi': 0 °
Name: CH (EL 5 to 0)	Unit Weight: 121 pcf	Cohesion': 400 psf	Phi': 0 °
Name: CH (EL 0 to -4)	Unit Weight: 121 pcf	Cohesion': 1,000 psf	Phi': 0 °
Name: CH (EL -4 to -16)	Unit Weight: 121 pcf	Cohesion': 1,600 psf	Phi': 0 °
Name: CH (EL -16 to -35)	Unit Weight: 119 pcf	Cohesion': 1,400 psf	Phi': 0 °
Name: CH (EL -35 to -60)	Unit Weight: 125 pcf	Cohesion': 2,400 psf	Phi': 0 °
Name: CH (EL -60 to -70)	Unit Weight: 119 pcf	Cohesion': 2,400 psf	Phi': 0 °
Name: CL (EL -70 to -80)	Unit Weight: 119 pcf	Cohesion': 1,200 psf	Phi': 0 °
Name: CH (EL -80 to -100)	Unit Weight: 119 pcf	Cohesion': 600 psf	Phi': 0 °



WALL 3
LONG TERM

Name: CL (EL 30 to 22)	Unit Weight: 125 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CL (EL 22 to 15)	Unit Weight: 125 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CL (EL 15 to 10)	Unit Weight: 125 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL 10 to 5)	Unit Weight: 121 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL 5 to 0)	Unit Weight: 121 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL 0 to -4)	Unit Weight: 121 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL -4 to -16)	Unit Weight: 121 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL -16 to -35)	Unit Weight: 119 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL -35 to -60)	Unit Weight: 125 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL -60 to -70)	Unit Weight: 119 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CL (EL -70 to -80)	Unit Weight: 119 pcf	Cohesion': 0 psf	Phi': 23 °
Name: CH (EL -80 to -100)	Unit Weight: 119 pcf	Cohesion': 0 psf	Phi': 23 °
Name: Embankment	Unit Weight: 128 pcf	Cohesion': 0 psf	Phi': 32 °

Geotextile Length = Wall Height
Long Term Strength = 2575 lb/ft
Miragrid 5XT or equivalent Geotextile

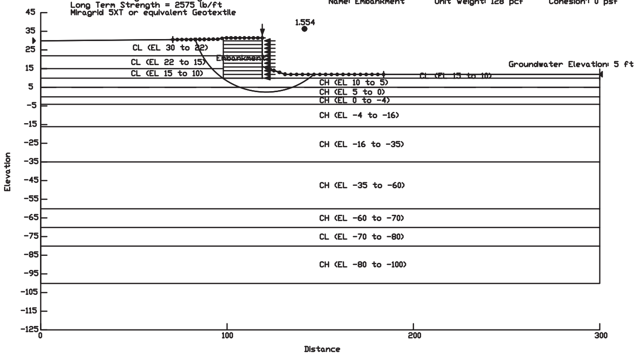


FIGURE 6b

PARISH	EAST BATON ROUGE
FEDERAL PROJECT	
PROJECT	12-CS-HC-0043

DESIGNED:	IAH
CHECKED:	LDS
DETAILED	IAH
CHECKED	JMA
DATE	11/9/2016
SHEET	1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

PAULAT BOULEVARD
MSE WALL
- GLOBAL STABILITY

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ATTACHMENT B

Railway Live Load
LL = 80,000 lbs / (8.5 ft * 5 ft)
(Sect. 4 pg. 9 KCS Guidlines)

KCS RR Slope Stability @ Picardy-Perkins Inputs

Perkins to Picardy Connector
Baton Rouge, Louisiana
Design Profile B-28, B-29, and B-30
Slope Stability with applied Shoofly Loading
& Sheet Pile Wall
16710-051-01

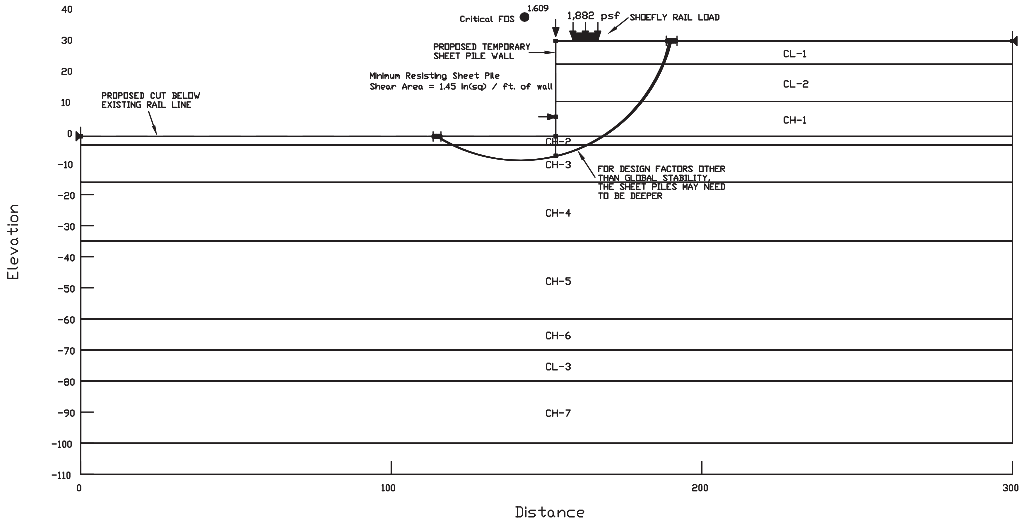
Total Excavation Height: 31 ft

Sheet Pile Assumptions & Model Inputs:
Minimum Sheet Pile Length: 37 ft.

Minimum Sheet Pile Embedment: 6 ft.*

Minimum Sheet Pile Resisting
Shear Force = 24,000 lbs

Name: CH-7	Model: Mohr-Coulomb	Unit Weight: 119 pcf	Cohesion': 600 psf	Phi': 0 °
Name: CL-3	Model: Mohr-Coulomb	Unit Weight: 119 pcf	Cohesion': 1,200 psf	Phi': 0 °
Name: CH-6	Model: Mohr-Coulomb	Unit Weight: 119 pcf	Cohesion': 2,400 psf	Phi': 0 °
Name: CH-5	Model: Mohr-Coulomb	Unit Weight: 125 pcf	Cohesion': 2,400 psf	Phi': 0 °
Name: CH-4	Model: Mohr-Coulomb	Unit Weight: 119 pcf	Cohesion': 1,400 psf	Phi': 0 °
Name: CH-3	Model: Mohr-Coulomb	Unit Weight: 121 pcf	Cohesion': 1,600 psf	Phi': 0 °
Name: CH-2	Model: Mohr-Coulomb	Unit Weight: 121 pcf	Cohesion': 1,000 psf	Phi': 0 °
Name: CH-1	Model: Mohr-Coulomb	Unit Weight: 121 pcf	Cohesion': 1,000 psf	Phi': 0 °
Name: CL-2	Model: Mohr-Coulomb	Unit Weight: 125 pcf	Cohesion': 700 psf	Phi': 0 °
Name: CL-1	Model: Mohr-Coulomb	Unit Weight: 125 pcf	Cohesion': 1,500 psf	Phi': 0 °



*THE MINIMUM SHEET PILE EMBEDMENT DEPTH OF 6 FEET WAS CHOSEN TO OBTAIN A FACTOR OF SAFETY OF 1.5 OR GREATER FOR GLOBAL STABILITY. LARGER EMBEDMENT DEPTHS WILL HAVE HIGHER FACTORS OF SAFETY. THIS MINIMUM EMBEDMENT DEPTH FOR GLOBAL STABILITY WILL PROBABLY NOT GOVERN THE SHEET PILE DEPTH REQUIREMENTS AS OBTAINED FROM THE ANCHORED SHEET PILE WALL DESIGN.

FIGURE 7

PARISH EAST BATON ROUGE
FEDERAL PROJECT
PROJECT 12-CS-HC-0043

DESIGNED: IAH
CHECKED: LDS
DETAILED IAH
CHECKED JMA
DATE 3/21/2014
SHEET 1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY

KCS SHOOFLY BRIDGE UNDERPASS - GLOBAL STABILITY

PAULAT BOULEVARD

PUBLIC WORKS

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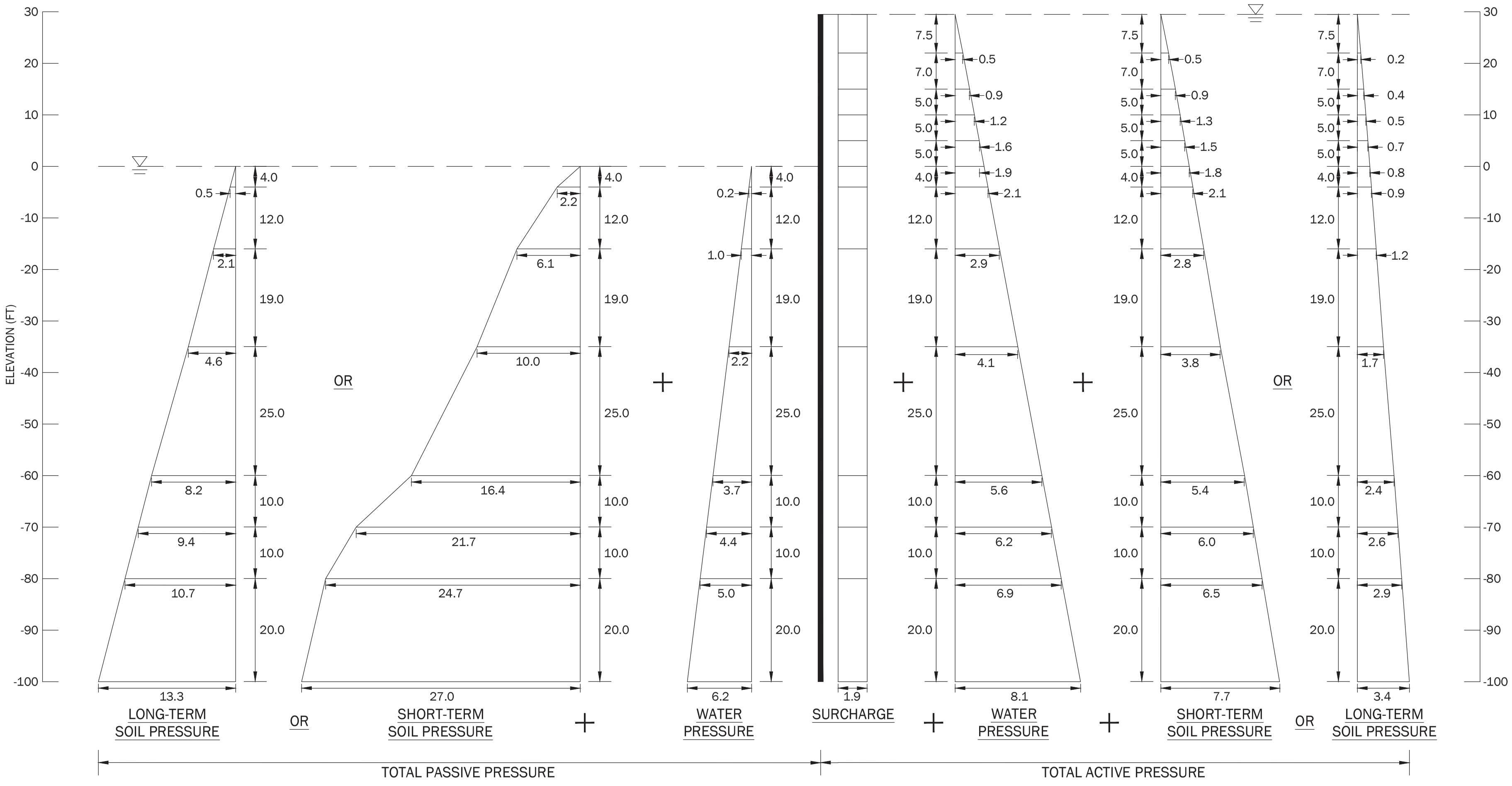
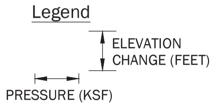
ATTACHMENT B





Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Lateral Earth Pressures

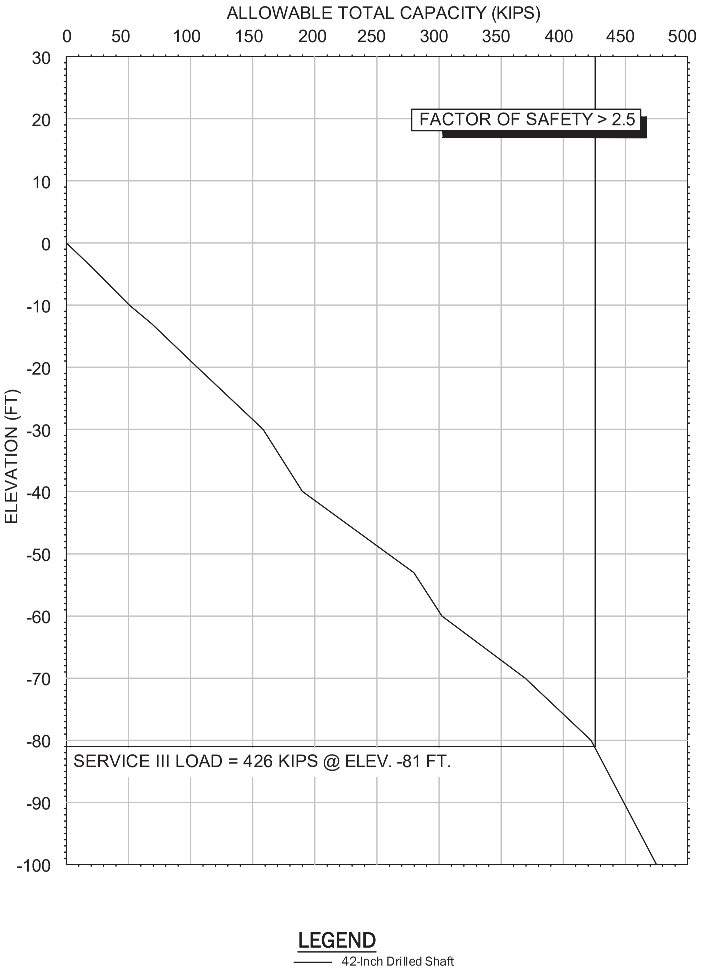
Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

GeoEngineers

Figure 8

P:\16\16710051\01\CAD\Lateral Earth Pressures.dwg TAB:Layout3-Layout1 Date Exported: 11/03/16 - 13:50 by kcook

ATTACHMENT B



Elevation	Total Capacity
Feet	Kips
0	0.0
-10	50.9
-20	105.6
-30	158.3
-40	190.2
-50	259.0
-53	279.8
-60	302.4
-70	369.5
-80	422.3
-90	448.6
-100	475.0

CHART INCLUDES A FACTOR OF SAFETY GREATER THAN 2.5.

Notes:
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Drilled Shaft Capacity
for Railroad Bridge

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

GEOENGINEERS

Figure 9

P:\16\1671005\01\CAD\Shaft Capacity.dwg\TAB:Chart A-1 (7) modified on Nov 03, 2016 - 1:54pm

IAH : KMC

ATTACHMENT B

Picardy to Perkins Connector
Baton Rouge, Louisiana
L-Pile and Group Analysis Design Soil Profile
Kansas City Southern Railroad Overpass Structure
Borings: B-28, B-29, B-30

	Elevation				**Unit Weight**							
Layer	**Top**	to	**Bottom**	Soil Type	**Total**	**Effective**	**Undrained Cohesion, c**	**Clay Strength Descriptor**	**Strain Factor, E50**	**p-y Modulus, k (static)**	**Ultimate Unit Side Friction**[1]	**Ultimate Unit Tip Resistance**[2]
	feet		feet		pcf	pcf	ksf		ft/ft	lbs/in^3	psf	psf
1	30	to	22	Stiff Clay with Free Water (Reese)	125	62.6	1.5	Stiff	0.005	500	1200	13,875
2	22	to	10	Soft Clay (Matlock)	125	62.6	0.7	Medium	0.01	100	700	6,475
3	10	to	-4	Soft Clay (Matlock)	121	58.6	1.0	Medium	0.01	100	1000	9,250
4	-4	to	-16	Stiff Clay with Free Water (Reese)	121	58.6	1.6	Stiff	0.007	500	1200	14,800
5	-16	to	-35	Stiff Clay with Free Water (Reese)	119	56.6	1.4	Stiff	0.007	500	1200	12,950
6	-35	to	-60	Stiff Clay with Free Water (Reese)	125	62.6	2.4	Very Stiff	0.005	1000	1200	22,200
7	-60	to	-70	Stiff Clay with Free Water (Reese)	119	56.6	2.4	Very Stiff	0.005	1000	1200	22,200
8	-70	to	-80	Stiff Clay with Free Water (Reese)	119	56.6	1.2	Stiff	0.007	500	1200	11,100
9	-80	to	-100	Soft Clay (Matlock)	119	56.6	0.6	Medium	0.01	100	600	5,550

[1] Ultimate Unit Side Friction, equal to cohesion up to 1,200 psf
[2] Ultimate Unit Tip Resistance (q_{bL}) = 9.25*S_u

L-Pile Input Parameters

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

GEOENGINEERS

Figure 10

ATTACHMENT B

APPENDIX A

Field Exploration

APPENDIX A
FIELD EXPLORATION

This appendix describes the field exploration piezometer installation program performed by GeoEngineers to support this project. The July 11, 2014 report contains detailed information about the field exploration and lab testing program in support of the design profiles developed for the site.

Groundwater conditions near the railroad underpass alignment adjacent to the existing Mall of Louisiana were explored on November 16, 2015. Explorations were conducted using a truck-mounted drill rig. Two borings were drilled, and a piezometer placed in each boring. During initial exploration, we observed two distinct groundwater elevations, and two piezometers were needed to monitor the different groundwater elevations.

Two piezometers were installed (B-21A and B-21B) because two separate groundwater tables were observed during initial site exploration. B-21A was installed to a depth of 35 feet and B-21B was installed to a depth of 20 feet. The piezometers were installed near boring B-21 that was drilled and tested for the first report.

We encountered a medium strength clay layer at the ground surface at piezometer location B-21A. The soil strength increased to very stiff with depth. We observed silt lenses and silt seams below about 23 feet bgs. At the B-21B ground surface, we encountered a hard clay that continued to about 5 feet bgs. Stiff to very stiff clay with silt and gravel pockets was observed below about 5 feet bgs. Logs of the piezometer borings are included in Appendix A.

Soil Borings

A field technician from GeoEngineers managed the drilling on a full-time basis; examined and classified the soils encountered, obtained representative samples, observed groundwater conditions and prepared a detailed log of each borehole. The soils encountered were classified visually in general accordance with ASTM International (ASTM) D2488. Logs of the explorations and piezometer installations are presented in Log of Borings, Figures A-1 through A-3. The approximate exploration locations are shown on Figure 3.

Borehole sampling and piezometer installation was conducted in general accordance with applicable ASTM specifications. High-quality, undisturbed, cohesive and semi-cohesive soil (clay/clayey silt) specimens suitable for laboratory strength testing were obtained using a 30-inch-long, 3-inch outside diameter (O.D.), thin-walled steel Shelby tube sampler. The sampler was hydraulically pushed into the ground a distance not exceeding 24 inches per specimen.

ATTACHMENT B

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	▨	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
			▨	GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	▨	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			▨	GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	▨	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			▨	SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	▨	SM	SILTY SANDS, SAND - SILT MIXTURES
			▨	SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	▨	ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
			▨	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			▨	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	▨	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
			▨	CH	INORGANIC CLAYS OF HIGH PLASTICITY
			▨	OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			▨	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
▨	CC	Cement Concrete
■	AC	Asphalt Concrete
▨	CR	Crushed Rock/ Quarry Spalls
▨	TS	Topsoil/ Forest Duff/Sod

▼	**Measured groundwater level in exploration, well, or piezometer**
▽	**Groundwater observed at time of exploration**
≡	**Perched water observed at time of exploration**

Graphic Log Contact

——	**Distinct contact between soil strata or geologic units**
╱	**Approximate location of soil strata change within a geologic soil unit**

Material Description Contact

——	**Distinct contact between soil strata or geologic units**
– – – –	**Approximate location of soil strata change within a geologic soil unit**

Sampler Symbol Descriptions

☒	**Standard Penetration Test (SPT)**
■	**Shelby tube**
▤	**Piston**
◧	**Direct-Push**
◫	**Bulk or grab**

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

A "P" indicates sampler pushed using the weight of the drill rig.

Laboratory / Field Tests

%F	**Percent fines**
AL	**Atterberg limits**
CA	**Chemical analysis**
CP	**Laboratory compaction test**
CS	**Consolidation test**
DS	**Direct shear**
HA	**Hydrometer analysis**
MC	**Moisture content**
MD	**Moisture content and dry density**
OC	**Organic content**
PM	**Permeability or hydraulic conductivity**
PP	**Pocket penetrometer**
SA	**Sieve analysis**
TX	**Triaxial compression**
UC	**Unconfined compression**
VS	**Vane shear**

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

KEY TO EXPLORATION LOGS

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FIGURE A-1

Drilled	Start 11/16/2015	End 11/16/2015	Total Depth (ft) 35	Logged By ZST/CH Checked By MJK	Driller GeoEngineers, Inc.
Drilling Method	Dry Auger 0' - 8' Wet Rotary 8' - 35'				

ATTACHMENT B

Hammer Data	Cathead Hammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	Failing 1500 Truck-mounted
Surface Elevation (ft) Vertical Datum	30.4	Top of Casing Elevation (ft)	
Latitude Longitude	N30° 23' 09.3" W91° 05' 13.3"	Horizontal Datum	NAD83 (feet)

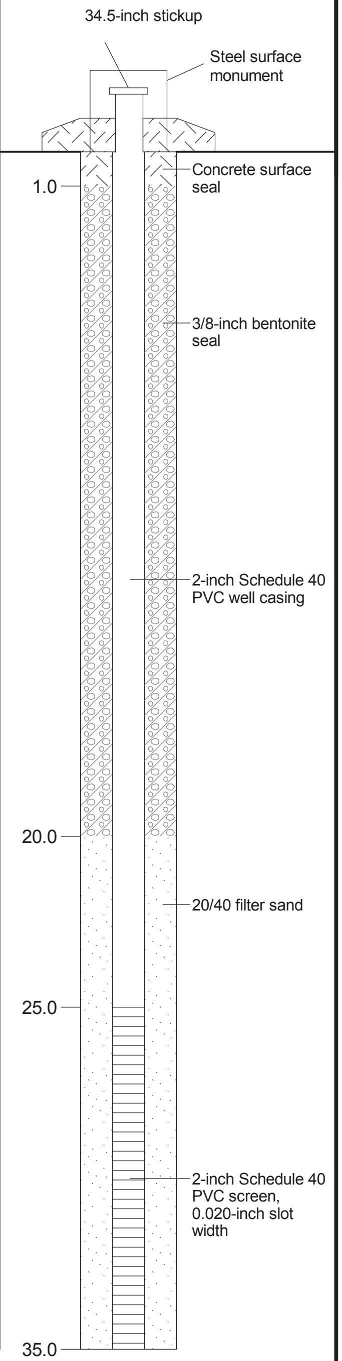
A 2 (in) well was installed on 11/16/2015 to a depth of 35 (ft).

Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
11/16/2015	8.0	22.4

Notes: See Figure A-1 for explanation of symbols.
Cement-bentonite grout backfill full depth

Elevation (feet)	Depth (feet)	FIELD DATA Interval	Recovered (in)	Blows/foot	Pocket Pen (tsf)	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)
30	0		14		0.5	1			CH	Medium tan clay with silt lenses, roots, and ferrous nodules		
			6		1.0	2				Stiff tan and gray clay with silt lenses, roots, and ferrous nodules		
25	5											
			15		1.0	3	▼			Stiff tan clay with silt lenses		
20	10											
			24		1.25	4				Stiff tan clay with ferrous streaks		
15	15											
			24		1.75	5				Stiff tan and gray clay with ferrous nodules and shell		
10	20											
			24		2.5	6				Very stiff tan and gray clay with silt seams, shell, and ferrous nodules		
5	25											
			16		2.5	7				Very stiff tan and gray clay with silt seams and ferrous nodules		
0	30											
			24		2.0	8				Very stiff tan and gray clay with silt seams, and 1-inch silt layer on bottom		
	35											

WELL LOG



Log of Boring B-21A

GEOENGINEERS

Project: Picardy - Perkins Connector Piezometers
Project Location: Baton Rouge, Louisiana
Project Number: 16710-051-01

Figure A-2
Sheet 1 of 1

ATTACHMENT B

Drilled	Start	End	Total Depth (ft)	Logged By	Checked By	Driller	Drilling Method
	11/16/2015	11/16/2015	20	ZST/CH	MJK	GeoEngineers, Inc.	Dry Auger 0' - 13' Wet Rotary 13' - 20'

Hammer Data: Cathead Hammer 140 (lbs) / 30 (in) Drop

Drilling Equipment: Failing 1500 Truck-mounted

Surface Elevation (ft) Vertical Datum: 30.4

Top of Casing Elevation (ft):

Latitude: N30° 23' 09.4"

Longitude: W91° 05' 13.1"

Horizontal Datum: NAD83 (feet)

A 2 (in) well was installed on 11/16/2015 to a depth of 20 (ft).

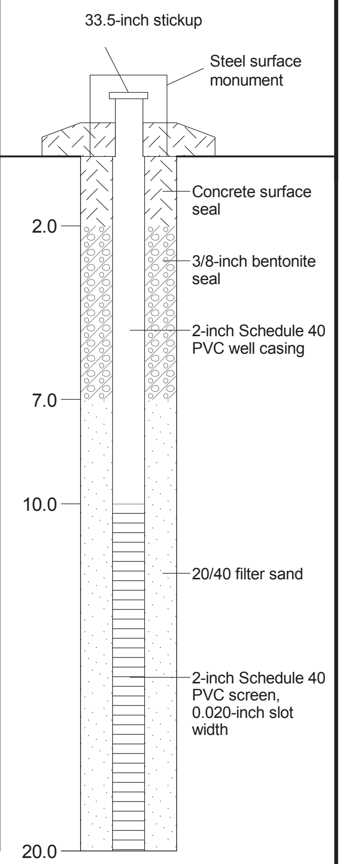
Groundwater

Date Measured	Depth to Water (ft)	Elevation (ft)
11/16/2015	13.0	17.4

Notes: See Figure A-1 for explanation of symbols.
Cement-bentonite grout backfill full depth

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Pocket Pen (tsf)	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)
30	0	■	10		<4.0	1			CH	Hard brown clay with asphalt and gravel		
		■	6		<4.0	2				Hard gray clay		
25	5											
		■	16		2.0	3				Very stiff tan and gray clay with silt streaks and ferrous nodules		
20	10											
							▽					
		■	14		1.75	4	▼			Stiff tan clay with ferrous nodules		
15	15											
		■	24		2.0	5				Very stiff tan and gray clay with ferrous nodules, calcareous pockets, gravel and silt pockets		
	20											

WELL LOG



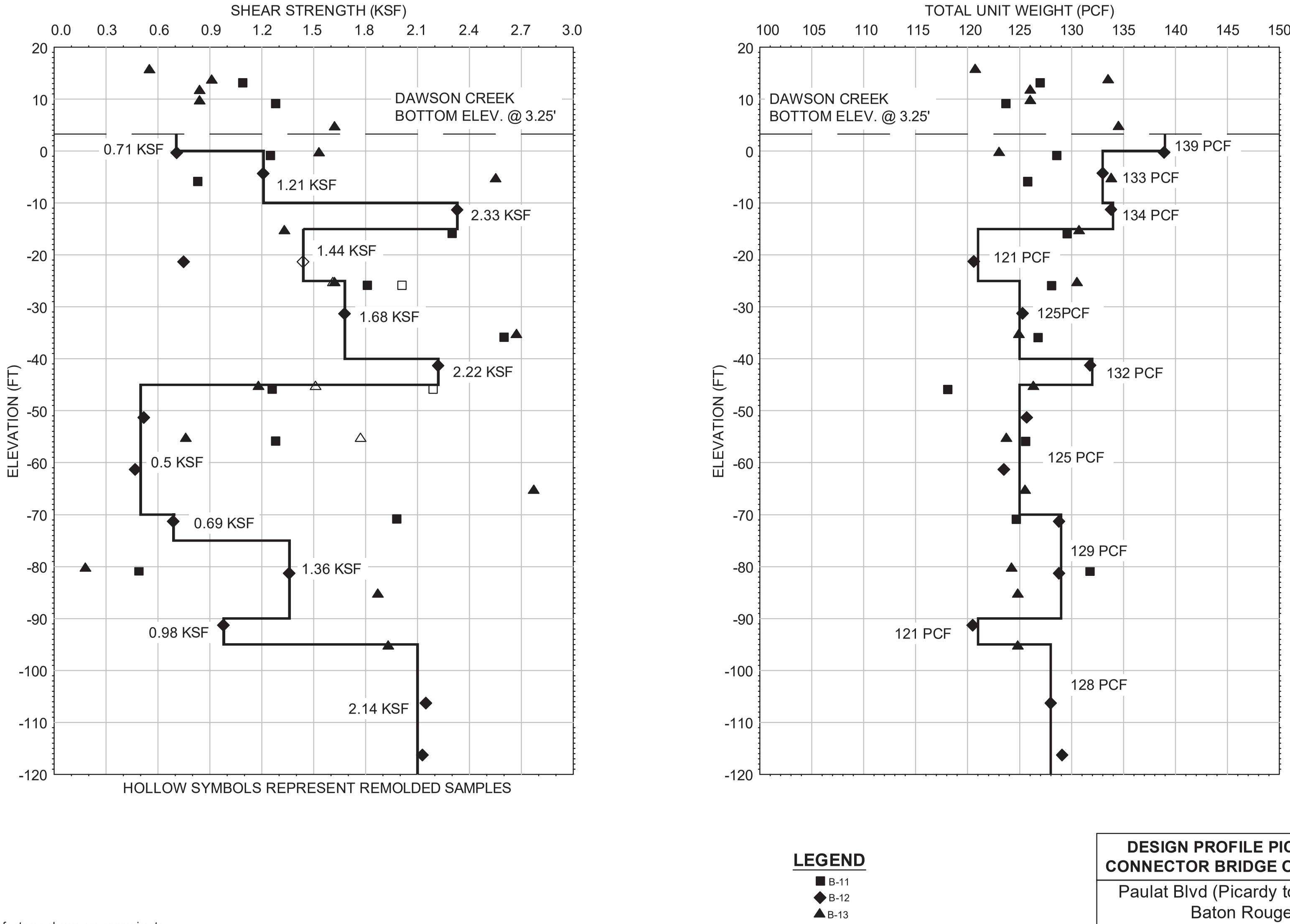
Log of Boring B-21B

GEOENGINEERS

Project: Picardy - Perkins Connector Piezometers
Project Location: Baton Rouge, Louisiana
Project Number: 16710-051-01

Figure A-3
Sheet 1 of 1

ATTACHMENT B



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

DESIGN PROFILE PICARDY TO PERKINS CONNECTOR BRIDGE OVER DAWSON CREEK

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

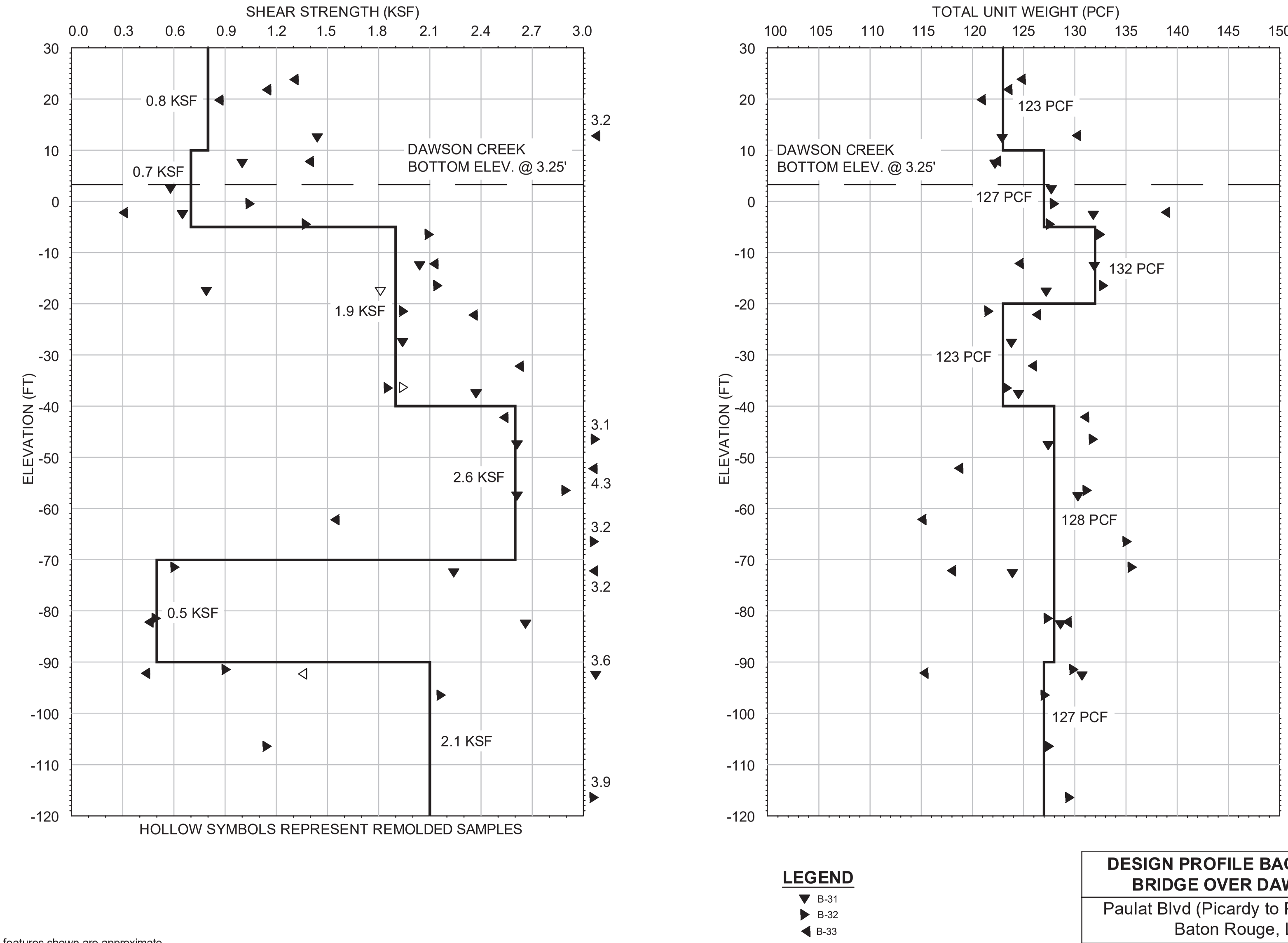
GEOENGINEERS

Figure A-4

IAH : KMC

P:\16\1671005\100\CAD\GRAPH-MC1.dwg\TAB:Chart A-1 (4) modified on Nov 03, 2016 - 2:22pm

ATTACHMENT B



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

DESIGN PROFILE BACKCOURT DRIVE BRIDGE OVER DAWSON CREEK

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

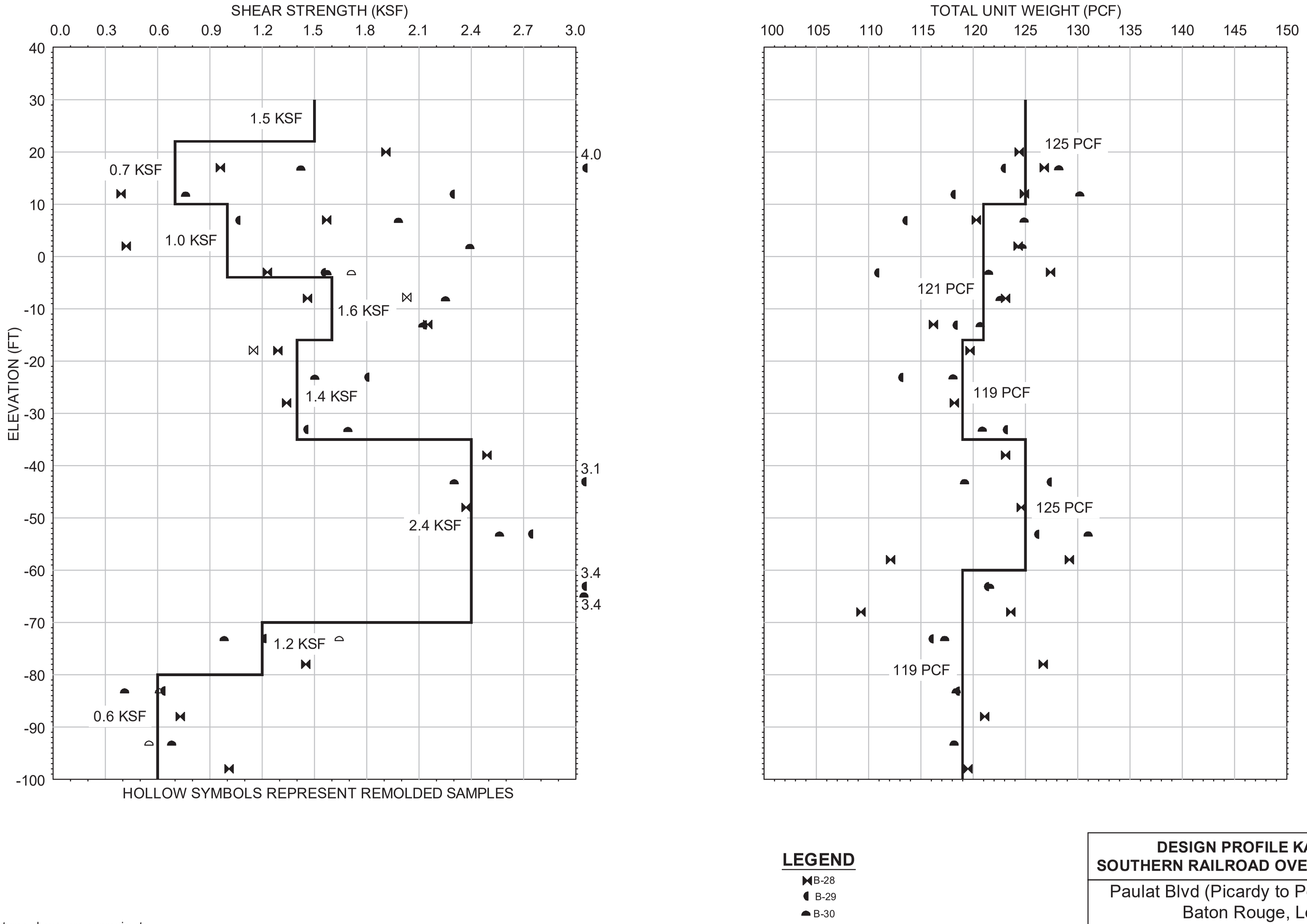
GEOENGINEERS

Figure A-5

P:\16\1671005\100\CAD\GRAPH-MC1.dwg\TAB:Chart A-1 (3) modified on Nov 03, 2016 - 2:27pm

IAH : KMC

ATTACHMENT B



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

DESIGN PROFILE KANSAS CITY SOUTHERN RAILROAD OVERPASS STRUCTURE

Paulat Blvd (Picardy to Perkins Connector)
Baton Rouge, Louisiana

GEOENGINEERS

Figure A-6

P:\16\16710051\00\CAD\GRAPH-MC1.dwg\TAB:Chart A-1 (5) modified on Nov 03, 2016 - 2:30pm

IAH : KMC

ATTACHMENT B

APPENDIX B
Drilled Shaft Installation Considerations

APPENDIX B
DRILLED SHAFT INSTALLATION CONSIDERATIONS

The purpose of this appendix is to furnish installation requirements of straight-sided drilled shafts for this project. Topics covered encompass a general description of shaft construction (including excavation stability and work performance details); particulars of steel reinforcement; and concrete quality/placement aspects. All such information is intended to supplement job specific construction specifications.

Excavation Stability

Borehole Excavation

Sizes, depths, and spacing of the shafts should be shown on the plans. Shaft excavations should be performed with a machine powered drilling rig. An augered hole may be excavated "in the dry" unless encountered soil conditions are such that the hole will not stand up without supplementary support techniques. If caving/squeezing occurs, or if there is excess seepage into the excavation, no further drilling should be allowed. The contractor should then be obligated to select a method of advancing the borehole so as to prevent ground movement and/or excess water inflow. These measures may consist of casing the excavation, wet boring with drilling mud, pumping, temporary dewatering, or any other measures that may be required to achieve the desired construction. The cost for any of the measures shall be included in the base bid for the project. No extras should be allowed for the use of these measures or any others that may be required.

Casing Requirements

Temporary casing, when employed as supplementary excavation support, should be of ample strength to withstand handling stresses and the external pressures of the caving soil and/or fluid. It should be water tight, smooth, and its interior should be clean. Generally, such casing is not employed in an excavation with a nominal diameter less than 18 inches. When a stratum of soil is encountered that will not cave or admit a significant amount of water, the bottom of any casing should be sealed in that formation. The excavation should be completed according to plan in the stratum specified. When necessary, the contractor should prepare the bottom of the casing with cutting teeth to facilitate sealing. The casing should be smooth and its interior should be clean. The outside diameter of the casing should not be less than the specified diameter of the drilled shaft. Casing length should be sufficient to provide adequate protection and safety against any caving soil and water inflow. Temporary casing should not be left in the ground except by permission of the engineer.

Casing Retrieval

The contractor should retrieve the casing at a slow, uniform rate after filling it with fluid concrete. Downward velocity of the concrete relative to the rebar cage, which occurs as the casing is pulled, should be kept low to prevent distortion of the cage as well as settlement of the cage due to penetration into the bearing stratum. The pull should be kept in line with the vertical axis of the shaft, and the level of concrete in the casing should be maintained so as to prevent intrusion of soil or groundwater during extraction. Elapsed time from the beginning of concrete placement in a cased shaft, until extraction of the casing is begun, should be consistent with the mix design.

Drilling Slurry

Borehole stabilization may be maintained using the slurry-displacement method of construction. Slurry level in the borehole must be kept well above the water table to ensure that no flow occurs into the borehole from the natural water. Excavation should be carried to final depth while the borehole is being stabilized with drilling fluid of ample density and viscosity. The bottom of the excavation should be cleaned by a clean-out bucket of appropriate dimensions, by an air lift, or by other appropriate means. Drilling fluid may be reused, but it should be processed, if necessary, to remove the granular material that is in suspension. No excavations for slush pits shall be made in the ground surface if the wet boring process is used. A portable mud pit shall be used.

Slurry Preparation

The preferred method of forming the slurry is to use a mixing plant, or mixing machine, and prepare the slurry prior to its placement. There are occasions when: (1) it is possible to add bentonite to the water in the excavation and to mix the bentonite with the drilling tools, or (2) to form a slurry by the mixing of suitable in-situ, drilled, fine-grained material during the boring. In all cases, the slurry properties should be tested and recorded prior to concrete placement.

Reinforcement Steel

Reinforcing steel should be the entire length of the shaft and be supported at its base. A minimum of ½ percent reinforcing steel should normally be used. The minimum clear spacing between rebar should be 1½ times the bar diameter. Centralizers on the rebar cage should be used to keep the cage properly positioned. Cross bracing in the form of either wires or reinforcing steel should be omitted from the shaft cage. If additional reinforcement is needed to maintain the rebar character during transit or concrete placement, it should be added at the direction and approval of the structural engineer.

Concrete Issues

Handling Technique

Concrete placement should begin immediately after the shaft has been excavated and the reinforcing steel is in place. Placement should be continuous in the shaft to the cut-off elevation joint indicated on the plans. Mechanical vibration of concrete should not be done: (1) inside a temporary casing because of the possibility that the concrete will arch and move upward when the casing is pulled, and (2) in cases where slurry is used and there is a chance of slurry remaining in the excavation. Vibration or rodding is recommended in other instances to a maximum depth of 5 feet below the top of the concrete column. Concrete that is beginning to take a set should not be disturbed by the excavation of an adjacent shaft: no drilling should be allowed within a clear distance of 5 shaft diameters.

Tremie Placement

Holes excavated using a wet drilling process shall have the concrete installed with a tremie pipe which shall be kept below the surface of fresh concrete at all times during pouring. No concrete shall be dropped through free water. The tremie must be clean and water tight, and the concrete must have good flow characteristics. In order to prevent contamination of the concrete placed initially, the bottom of the tremie or pump line should be sealed with a diaphragm or plate that is pushed away when the hydrostatic pressure from the column of concrete exceeds that of the external fluid. The top of the column of concrete may be contaminated by mixing with the slurry or with water. This contaminated concrete must be removed.

Aggregates

The maximum size of coarse aggregate should be 1/3 of the reinforcement steel clear spacing.

Slump Ranges

The recommended ranges of concrete slump are given for various circumstances:

Slump Range, Inches	Typical Conditions
5 ± 1	Poured into water-free uncased borehole. Widely-spaced reinforcement.
6 ± 1-1/2	Close spacing of reinforcement. Permanent or extracted casing. Shaft diameter less than 30 inches.
7 ± 1	Concrete placed under water or under drilling slurry.

Strength

The concrete fill shall have a 28-day ultimate compressive strength of 3,000 psi or greater.

Construction Deviation

Drilled shafts shall be installed to within 3 inches of the design locations. Any foundations out more than 3 inches shall have the entire installation surveyed by a licensed surveyor paid by the contractor. The foundation will be analyzed using these as installed locations. Cost for the analysis and any redesign and additional construction, including any additional foundations necessary, shall be borne by the contractor.

APPENDIX C

Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services Are Performed For Specific Purposes, Persons And Projects

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers and their design team for their design of the Paulat Boulevard (Picardy to Perkins Connector Project) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Or Geologic Report Is Based On A Unique Set Of Project-Specific Factors

This Geotechnical Engineering Evaluation is for use by Evans-Graves Engineers and their design team for their design of the Paulat Boulevard (Picardy to Perkins Connector Project) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, and slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical And Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering Report Or Geologic Report Could Be Subject To Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw The Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors A Complete Report And Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors Are Responsible For Site Safety On Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic And Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project

ATTACHMENT B

Geotechnical Engineering Services

Pump Station for Mall of LA Boulevard
(former Picardy to Perkins Connector)
Baton Rouge, Louisiana

for
Evans-Graves Engineers, Inc.

December 22, 2020

GeoEngineers
Earth Science + Technology

ATTACHMENT B

Geotechnical Engineering Services

Pump Station for Mall of LA Boulevard
(former Picardy to Perkins Connector)
Baton Rouge, Louisiana

for
Evans-Graves Engineers, Inc.

December 22, 2020

GeoEngineers
11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

ATTACHMENT B

Geotechnical Engineering Services
Pump Station for Mall of LA Boulevard
(former Picardy to Perkins Connector)
Baton Rouge, East Baton Rouge Parish, Louisiana

File No. 16710-051-03

December 22, 2020

Prepared for:

Evans-Graves Engineers, Inc.
9029 Jefferson Highway, Suite 200
Baton Rouge, Louisiana 70809

Attention: Gerald G. Menard, PE

Prepared by:

GeoEngineers, Inc.
11955 Lakeland Park Boulevard, Suite 100
Baton Rouge, Louisiana 70809
225.293.2460

Cody K. Hatch, PE
Geotechnical Engineer

Larry D. Sant, PE
Associate & Geotechnical Engineer

LARRY DEAN SANT
License No. 35625
12-22-2020

James M Aronstein Jr.

James M. Aronstein, Jr., PE
Principal

CKH: LDS: JMA: kc

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LIST OF FIGURES

APPENDICES

ATTACHMENT B

1.0 INTRODUCTION

This report is an addendum to the Geotechnical Engineering Services report provided on July 11, 2014 and presents the results of our geotechnical engineering services in support of your design of the Mall of Louisiana (LA) Blvd pump station project (former Picardy to Perkins Connector) in Baton Rouge, Louisiana. Our understanding of the project was developed through discussions with and review of materials transmitted by Evans-Graves Engineers, Inc. (Evans-Graves).

We understand that the project also will include about 3,000 lineal feet of new roadway, two pairs of bridges over Dawson Creek, one railroad overpass bridge, one below-grade roadway with retaining walls, and privacy walls. Excerpts from the plans provided to us from Evans-Graves are attached in Appendix A.

2.0 SCOPE OF SERVICES

Our services for this project were completed in general accordance with our Services Agreement executed May 29, 2020. The scope of services was based on the information provided by you during our meetings and correspondence. The purpose of our geotechnical services is to provide geotechnical recommendations specific to this site for design and construction of the pump station based on site exploration, laboratory testing and geotechnical engineering analyses. Our services are outlined as follows:

1. Evaluated volume/rate of groundwater seeping into the drainage control below the underpass, including seepage at MSE Wall.
2. Provided soil characteristics recommendations, including:
   - soil design unit weight;
   - active, at-rest and passive coefficients (level and sloped);
   - concrete/soil friction angle or cohesion; and
   - groundwater elevation (and dewatering).
3. Provided recommendations for bottom-slab support, including:
   - soil bearing capacity;
   - pile support; and
   - bedding recommendations below slab.
4. Review plans developed by Stantec and Evans-Graves.
5. Provide this report addendum #2.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1. Groundwater Seepage

Piezometers were installed and monitored at two locations as described in our November 9, 2016 report addendum. The groundwater elevations remained relatively steady during monitoring.

When critical to design, construction, and foundation performance, the most adverse groundwater condition should be anticipated. In general, this would occur with the water table at the ground surface or the surface of fill.

We evaluated the flow rate of groundwater seeping into the drainage control, including seepage at the MSE wall, based on our groundwater measurements. The seepage from groundwater should be about 6 cubic feet per day. The seepage rate will vary with weather and seasons.

3.2. Soil Characteristics Recommendations

See the table below for a summary of the design soil unit weights.

TABLE 1. DESIGN SOIL UNIT WEIGHTS

Elevation at Top of Layer (ft)	Elevation at Bottom of Layer (ft)	Design Soil Unit Weight (pcf)
30	10	125
10	-35	119
-35	-60	125
-60	-100	119

The lateral earth pressure coefficients are shown in Table 2 below. For these conditions, the active pressure on the opposite side of a footing must be subtracted from the passive resistance. Appropriate factors of safety should be applied. Where applicable, hydrostatic pressures must be added.

TABLE 2. LATERAL EARTH PRESSURE COEFFICIENTS

Condition	Temporary	Long Term
Active	1	0.44
At-rest	1	0.5
Passive	1	2.28

If spread footings are used to resist horizontal forces, the coefficient of friction between concrete and soil can be taken as 0.3. The design engineer should apply the appropriate safety factor against sliding. The coefficient of friction can be used to analyze the footing in conjunction with the above passive value.

For vertical forces, an adhesion between concrete and undisturbed clay soil of 600 pounds per square foot (psf) may be used. The design engineer should apply the appropriate safety factor.

If backfilling with uncompacted sand, a reduced friction angle of 25 degrees may be used. The design engineer should apply the appropriate safety factor.

3.3. Bottom-Slab Support Recommendations

We understand that the pump station will be embedded into the ground. We recommend using a net allowable bearing pressure of 4,000 psf. Because the pump station is mostly below natural ground surface, the weight of the station, equipment, and contents is usually less than the weight of soil removed. Therefore, bearing and settlement should not be a problem.

See Figure 1 for an upward pile capacity curve for HP12x53 steel piles, if needed. This same curve also could be used for downward capacity, if needed. The design engineer should apply the appropriate safety factor to the load.

The bottom of the excavation should be prepared as described in our original report dated July 11, 2014.

4.0 LIMITATIONS

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers and their design team for their design of the Mall of LA Blvd pump station (former Picardy to Perkins Connector) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form or hard copy of this document (email, text, table, and/or figure), if provided, and any attachments are only a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

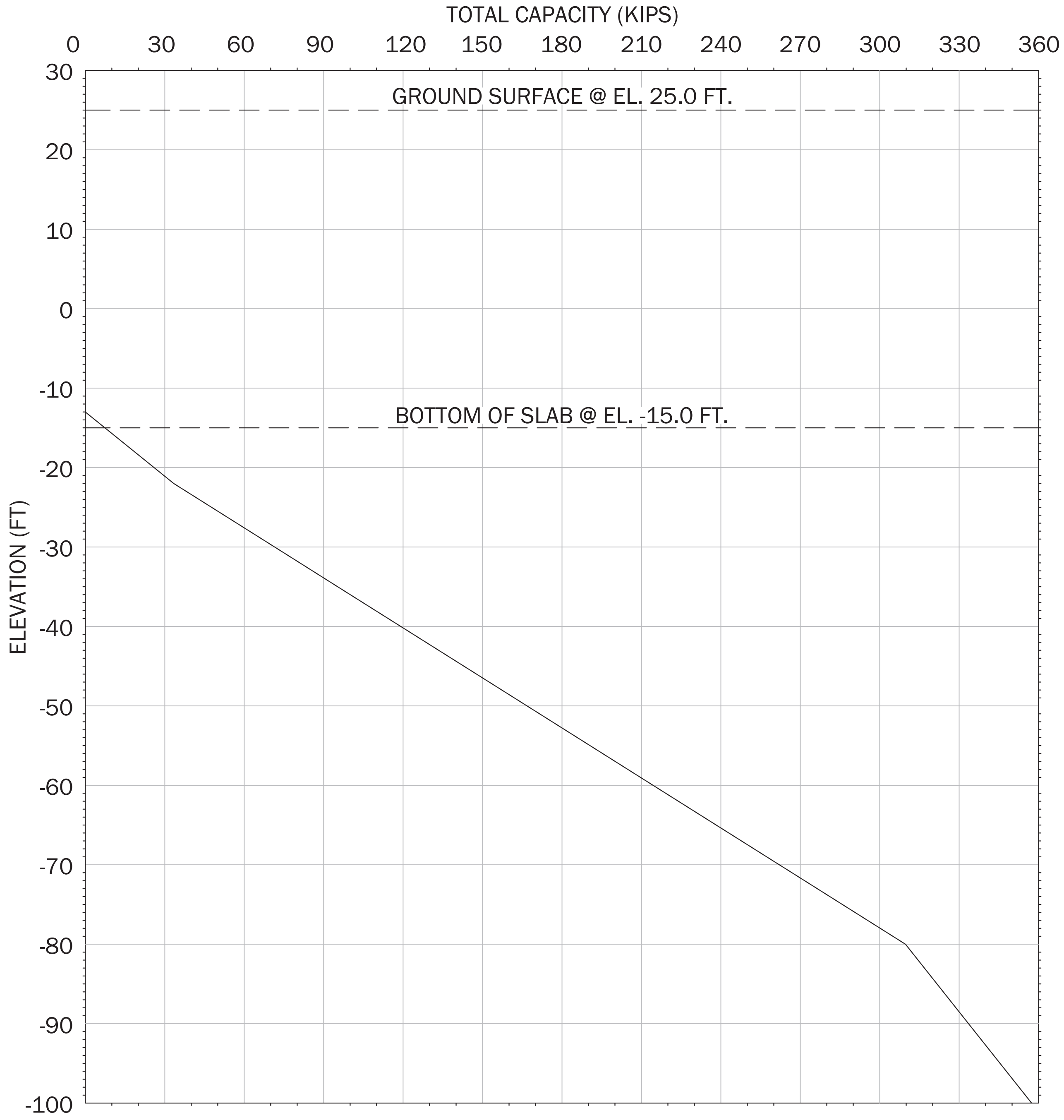
Please refer to Appendix A titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

We appreciate the opportunity to work with you on this project. If you have any questions regarding this report, or if you need additional information, please call.

ATTACHMENT B

FIGURES

ATTACHMENT B



Legend

───	HP12x53

Pile Capacity Curve

City of BTR - Picardy to Perkins Connector
Baton Rouge, Louisiana

GeoEngineers

Figure 1

P:\16\16710051\03\CAD\Geotech\1671005103_F01_Capacity Curve.dwg TAB:FA1 - Capacity Date Exported: 12/21/20 - 8:00 by kcook

ATTACHMENT B

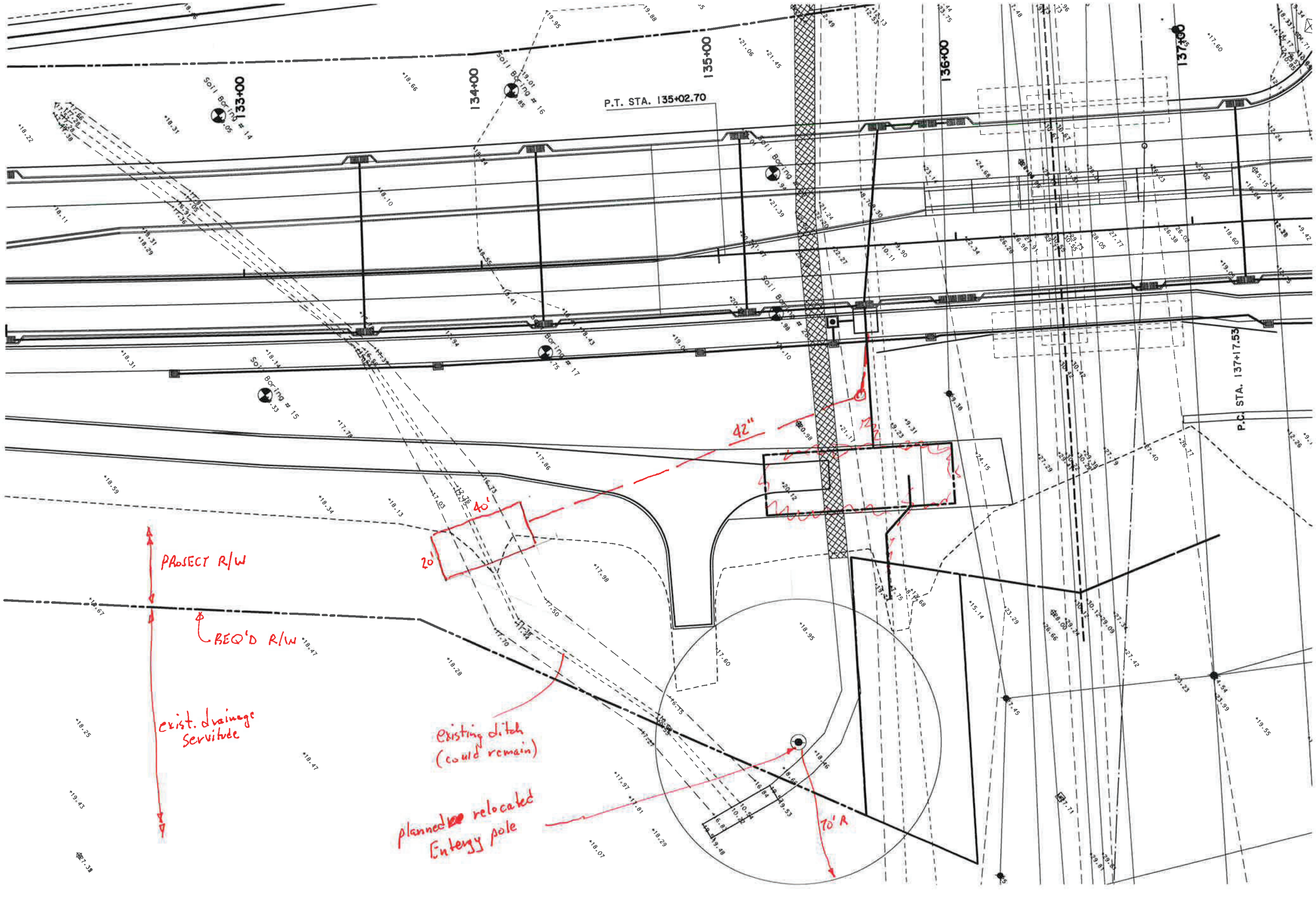
APPENDICES

GeoEngineers

APPENDIX A

Plans from Evans-Graves

ATTACHMENT B



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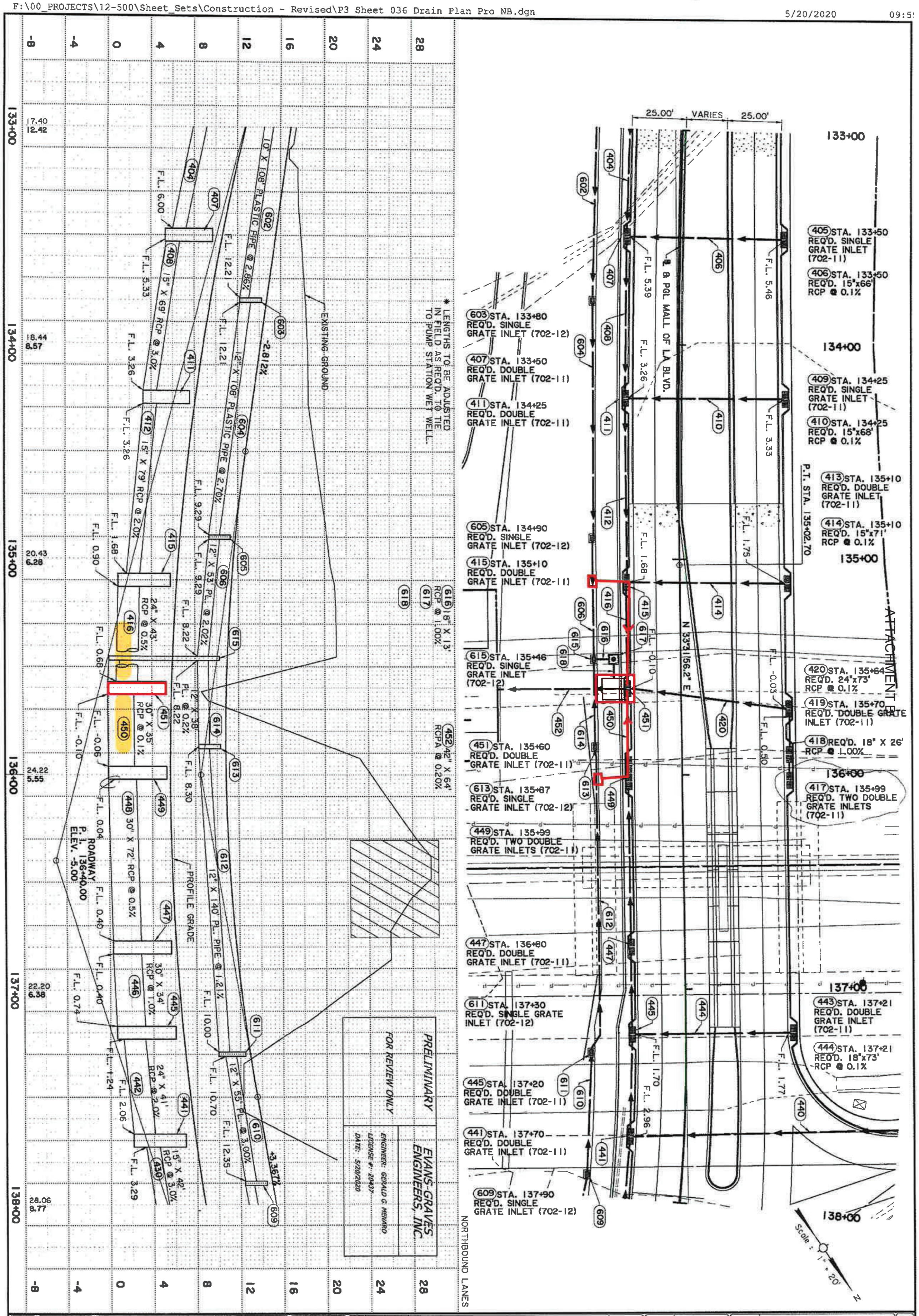
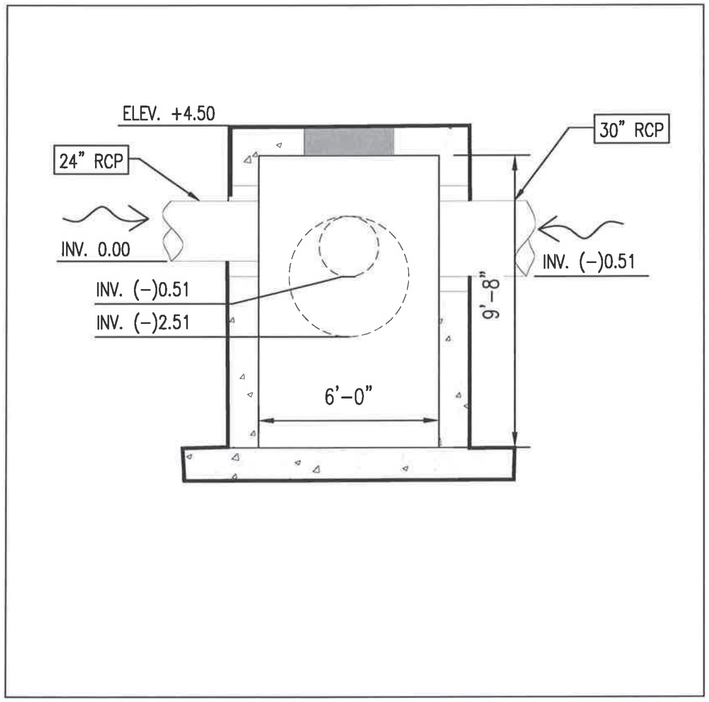


EVANS-GRAVES ENGINEERS	DRAINAGE PLAN AND PROFILE RT. SIDE	
	MALL OF LOUISIANA BOULEVARD	

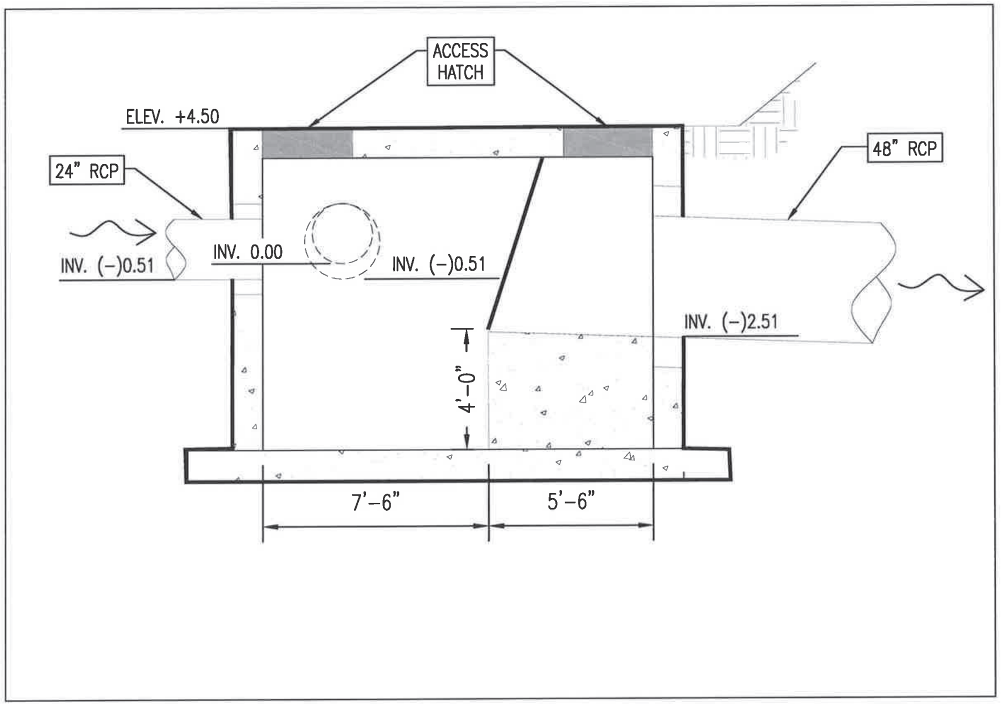
NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

DESIGNED CHECKED	GGM	PARISH	EAST BATON ROUGE	SHEET NUMBER
DETAILED CHECKED	MLR GGM	CITY	BATON ROUGE	36
DATE SHEET		PROJECT	12-CS-HC-0043	

ATTACHMENT B



TRASH RACK – FRONT VIEW



TRASH RACK – SIDE VIEW

SHEET NUMBER 502
PARISH EAST BATON ROUGE
CONTROL SECTION BATON ROUGE
STATE PROJECT 12−CS−HC−0043
DESIGNED TCA
CHECKED RR
DETAILED ELR
CHECKED RR
SERIES NUMBER SEPTEMBER 2018

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

PS PLAN & PROFILE
MALL OF LA BOULEVARD

Stantec

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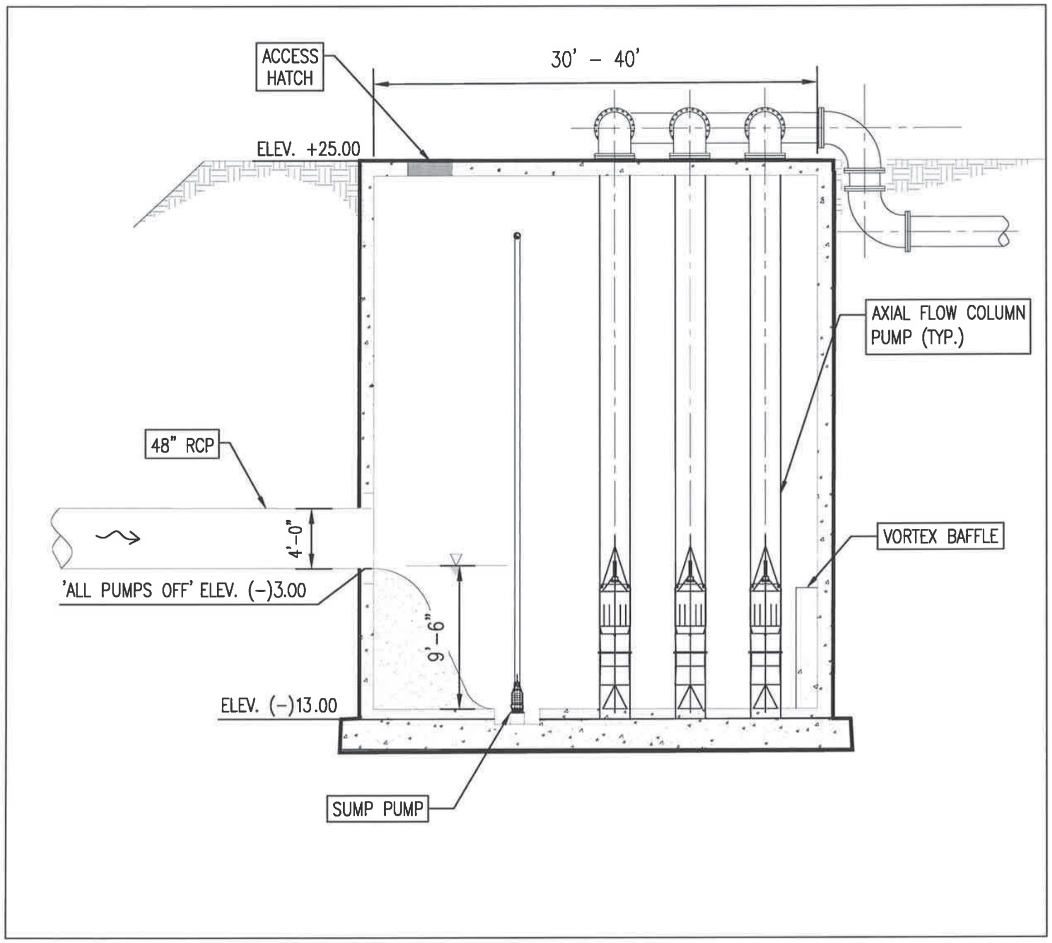
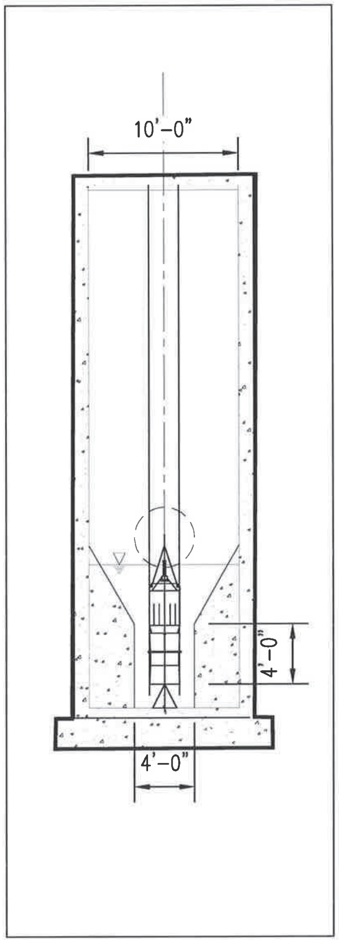
ATTACHMENT B



WET WELL - SIDE VIEW



WET WELL - FRONT VIEW

SHEET NUMBER	502
PARISH	EAST BATON ROUGE
CONTROL SECTION	BATON ROUGE
STATE PROJECT	12-CS-HC-0043
DESIGNED	TCA
CHECKED	RR
DETAILED	ELR
CHECKED	RR
SERIES NUMBER	SEPTEMBER 2018

NO.	DATE	REVISION OR CHANGE ORDER DESCRIPTION	BY

PS PLAN & PROFILE

MALL OF LA BOULEVARD

Stantec

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APPENDIX B

Report Limitations and Guidelines for Use

APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services Are Performed For Specific Purposes, Persons And Projects

We have prepared this Geotechnical Engineering Evaluation for use by Evans-Graves Engineers and their design team for their design of the Mall of LA Blvd pump station (former Picardy to Perkins Connector) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering Or Geologic Report Is Based On A Unique Set Of Project-Specific Factors

This Geotechnical Engineering Evaluation is for use by Evans-Graves Engineers and their design team for their design of the Mall of LA Blvd pump station (former Picardy to Perkins Connector) and associated structures for the City of Baton Rouge located in East Baton Rouge Parish, Louisiana. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, and slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical And Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering Report Or Geologic Report Could Be Subject To Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw The Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors A Complete Report And Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors Are Responsible For Site Safety On Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor’s procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

Geotechnical, Geologic And Environmental Reports Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project

ATTACHMENT B